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The Journal of Indian Art and Industry.

SOME ACCOUNT OF THE THIRTY-SEVEN NATS (ROYAL GHOSTS) OF THE BURMESE.

By R. C. TEMPLE, C.I.E.

NO one can be long in Burma without hearing of the Thirty-seven Nats, and every book on the Burmese, from the writings of the most learned scholars and most competent observers to those of the butterflies of literature, who flutter through the country and write about it, contains more or less elaborate and more or less accurate notices of them, and still it has always been most difficult to say definitely what the word actually means or what the Nats are really supposed to be. Perhaps the most nebulous ideas of all on the subject are those of the persons who openly or secretly believe in them, and yet the Nats pervade all Burma and are in one form or another held in awe by all the native population, Burmese or otherwise by descent, whether Buddhist or Pantheistic by faith, whether civilised or savage, whether enlightened so far as Oriental wisdom can teach or entirely ignorant. The subject for study thus opened up is very wide, very complicated, and to the student of anthropology of some importance. I have in hand a book (to be largely illustrated in monochrome and colours by Messrs. Griggs from Burmese drawings, paintings and carvings in my possession) of the whole of the Thirty-seven Nats, but on the present occasion I shall confine myself to a brief exposition of the historical aspect of the subject and to a short explanation of the representation of twenty-two of the Nats, taken from a fine series of paintings contained in a *parabaik* or manuscript by an anonymous Burmese artist.

Speaking generally, the Nats are supernatural beings derived from three separate sources—the supernatural beings of the Buddhists, celestial, terrestrial and infernal, derived from the old Brahmanic cosmogony of India; the tutelary spirits that fill the Earth and all that is thereon, man himself and all the creatures, objects and places amongst which he lives and moves and has his being, derived from the ancient animistic pre-Buddhist beliefs of the people; and the ghosts and spirits of the departed. In such a hierarchy as this there are, as there plainly must be, many Orders, and the object of the present notes—the Order of the Thirty-seven Nats—belongs to the category of ghosts and spirits of departed heroes, except in one instance, the chief of the Order, Thagyá Nat, who springs from ancient Indian Brahmanic ideas.

Now not only are all the Thirty-seven Nats (excepting Thagyá Nat) ghosts of departed heroes, but they all, except one other, purport to be the spirits of persons either themselves royal, or directly or indirectly connected with royalty. The stories, as now commonly current, are also not necessarily fastened on to persons very long since dead. The majority of them were alive between the thirteenth and seventeenth centuries of our era, and some less than two hundred years ago. One was well known to the early Portuguese settlers and was often mentioned in their accounts. Every Nat has his or her own cult, *i.e.*, an appropriate ceremony or festival, and an appropriate time and place for performing it, which is in every case of interest to the student; but just now I must confine myself to a historical notice.

The origin of the number thirty-seven may be taken to have arisen in this way. The most popular celestial being who interferes benevolently in the affairs of this Earth, in Burmese Buddhist idea, is Thagyá Nat, who, according to the orthodox Buddhist cosmogony, is the Lord of the Heaven of the Thirty-three, the Trayastrimça of Sanskrit and Tawatimsa of Pali. To these thirty-three Nats were dedicated thirty-seven popular hymns chaunted at the various festivals, and when the Burmese came to fastening these hymns on to the ghosts of their popular heroes they fixed the number of individuals at thirty-seven also. As the names of the majority of them will now come before the reader, I give here what a prolonged study of the subject induces me to call the Orthodox List. The qualifications for admission into the list are such as might be expected:—great prominence, strong personality or striking performances during life; or one of those sudden, cruel, startling deaths or tragic, terrifying fates only too common in Burman, as in all Oriental, history.

The Orthodox List of the Nats.

1. Thagyá Nat.
2. Mahágíri Nat.
3. Hnamádawgyí Nat.
4. Shwe Nabé Nat.
5. Thónban Hla Nat.
6. Taung-ngu Mingaung Nat.
7. Mintará Nat.
8. Thandawgán Nat.
9. Shwe Nawrathá Nat.
10. Aungzwámagyí Nat.
11. Ngázíshin Nat.
12. Aungbinlè Sinbyushin Nat.
13. Taungmagyí Nat.
14. Maung Minshin Nat.
15. Shindaw Nat.
16. Nyaung-gyin Nat.
17. Tabìn Shwédí Nat.
18. Minyè Aungdin Nat.
19. Shwe Sippin Nat.
20. Mèdaw Shwésagá Nat.
21. Maung Po Tu Nat.
22. Yun Bayìn Nat.
23. Maung Minbyú Nat.
24. Mándalé Bódaw Nat.
25. Shwébyin Naungdaw Nat.
26. Shwébyin Nyídaw Nat.
27. Minthá Maung Shin Nat.
28. Tíbyusaung Nat.
29. Tíbyusaung Mèdaw Nat.
30. Bayìnmáshin Mingaung Nat.
31. Min Síthú Nat.
32. Min Kyawzwá Nat.
33. Myaukpet Shinmá Nat.
34. Anauk Míbayá Nat.
35. Shingón Nat.
36. Shingwá Nat.
37. Shin-nèmí Nat.

The orthodox numbering has no reference to chronological order, but the stories do nevertheless refer to five distinct cycles of legends which are grouped round the popular stories of great historical personages of the remote and comparatively recent past alike. In each cycle or group the several stories are clearly connected and dependent on each other. The legends cover practically the whole of Burmese history. In order, therefore, to obtain anything approaching a clear understanding of the Nat stories and their sequence, it is necessary to be in possession of the outlines of the exceedingly complicated political history of Burma. To explain this it must be understood that there are three separate races which have had a hand in forming the dynasties connected with the Nat stories—the Burmans, the Shans and the Talaings, who have all been mixed up together, dynastically speaking, and have constantly ousted each other as ruling races for a time in practically all parts of the country. Very briefly and roughly the story in outline is this, so far as the Nat stories are concerned. There were legendary Burman kings at Tagaung, followed by a connected Burman dynasty at Prome and then Pagàn, from 483 B.C. to 1298 A.D., followed in its turn by two contemporary Shan lines at Pinyá and Sagaing up to 1364. With the last two was a contemporary Burman line at Tonghoo from 1313 to 1450, which at that date became absorbed into the Burman dynasty of Pegu. The Shan lines of Pinyá and Sagaing became merged in the Burman line of Ava, which was upset by the Burman dynasty of Pegu in 1551. This then became a general dynasty of Pegu and Ava from 1581 to 1751, giving way to a Shan dynasty of Pegu, which was soon conquered by the last Burman dynasty of Alompra, lasting from 1757 to 1885. There was also a Talaing dynasty of Thaton and Pegu from 573 to 1050, when the country became tributary to the Burmese Pagàn dynasty till 1287, when a Shan dynasty was set up at Pegu till it was ousted by the Burman Tonghoo line in 1540. Pegu then became merged in the Burmese Ava dynasty till 1740, when for 17 years a second Shan line was established there, finally giving place to the Alompra dynasty in 1757.

With this much information at his disposal I trust that the reader will be able to follow the grouping of the legends. The first group, which may be called the Duttabaung Cycle, relates to the old legendary Burman dynasty of Tagaung and Prome, and centres about that old-world hero of Burma, King Duttabaung of Prome, ostensibly carrying us back to the days about the foundation of the Buddhist era in the VIth century B.C. The second group, or the Anawratházaw Cycle, purports to relate to the immediate surroundings of the conqueror Anawratházaw of Pagàn in the XIth century A.D., but in reality it wanders about in a confused kind of way amongst his immediate predecessors and descendants. The third group, or the mixed Ava Mingaung and Pagàn Alaungsíthu Cycle, is meant to relate to the Burman dynasty of Ava (1364-1551) in the XVth century. But the stories have become so confused in their references as to relate equally to the days of Alaungsíthu of Pagàn, a great name in Burmese history, and his successors of the XIIth and XIIIth centuries; to the much earlier kings of Pagàn of the VIIIth century; and to the Shans of Pinyá in the XVth century. The fourth group, or the Tabìn Shwédí Cycle, relates to the great Tabìn Shwédi himself of Tonghoo and Pegu, and the contemporary subordinate dynasty of Prome in the XVIth century. The fifth group, or the Bayìn Naung Cycle, relates to even later dates connected with the Bayìn Naung of Pegu and Ava and his successors of the Ava-Pegu dynasty (1581-1751) in the XVIth and XVIIth centuries.

I would draw special attention to the exceedingly modern nature of many of these stories. The centuries B.C. and the VIIIth and even XIth centuries A.D. might be legitimate dates for legendary stories of spirits; but the bulk of these tales belong to the period contained between the XIIth and XVIIth centuries A.D., so late a date as 1558 being well authenticated for one story, and the still later date of about 1620 being hardly doubtful for another. Even so recent a conqueror as Tabìn Shwédí, reigning from 1530 to 1550, during the reign of our own King Henry VIIIth, and well known to the earlier European settlers in Pegu, who actually fought for and against him in considerable numbers, is himself a prominent Nat.

The illustrations published in this number of the *Journal of Indian Art* well illustrate Groups I., IV. and V., fairly illustrate Group III., and hardly touch the interesting legends connected with the greatest hero in Burmese history, Anawratházaw. The legend of each group—not the history, be it remembered—in its main features is as follows:—

Group I. consists of seven Nats with a truly folklore story connected with the early hero, King Duttabaung of Prome. Nga Tindè, the Burmese Samson, a blacksmith by trade, was treacherously burnt alive by the King of Tagaung, who had married his sister, Ma Sawmè. She thereupon burnt herself with her brother. Nga Tindè married the daughter of the sea-serpent (*yénagá*) and by her he had two sons, who grew up out of two eggs, and were killed in a boxing match ordered by King Duttabaung of Prome. King Duttabaung had a wife of great beauty, whom, owing to a calumny, he neglected and forced to earn her living as a weaver; but he nevertheless had a daughter by her, who died with her mother. The illustrations of this legend are of the following Nats:—No. 2, Mahágíri Nat, who is Nga Tindè himself, usually represented in Court dress standing, supported

by three *balús*, or ogres, on a kneeling elephant. No. 3, Hnamádawgyi Nat, who was Nga Tindè's sister. She is usually represented as a woman standing in Court dress of a high class, supported by a *balú* on a kneeling elephant. No. 4, Shwe Nabé Nat, the daughter of the sea-serpent and wife of Nga Tindè, usually represented as a girl standing in Court dress of a high class. No. 5, Thónban Hla Nat, King Duttabaung's neglected wife, who is usually represented as a girl standing in the Court dress of a royal attendant, supported by a Burmanised representation of the Brahmanic elephant-headed god Ganéça, thus showing the Indian origin of the cult. Nos. 13 and 14, Taungmagyí Nat and Maung Minshin Nat, who were the two boys born from the eggs brought forth by Nga Tindè's serpent wife. This pair is usually represented as a couple of six-armed soldiers standing in Court costume. The arms in each case hold a quoit, a *dah* or sword, and a couple of spears. The six arms plainly show the Indian origin of this cult also.

Group II. consists of nine Nats, who purport to centre round the great conqueror Anawratházaw of Pagàn. The outline of this group of legends is as follows:—King Kyaungbyu Min of Pagàn had three sons—two by one queen named Kyizo and Súkadé, who deposed their father, and a third younger one, Anawratházaw, who became the great conqueror, by another queen. Kyizo succeeded first and was accidentally killed; aud afterwards Súkadé was dethroned and slain by Anawratházaw. Anawratházaw had in his service two brothers named the elder and the younger Shwébyin, natives of India, whom he sent to fetch a holy tooth-relic from China, but slew on their return for resisting his orders. They had a guardian, who was a Brahman and Minister of the King, with the title of the Mándalé Bódaw. He and his sister were slain at the same time as the brothers. Historically the story of the Mándalé Bódaw and the two Shwébyin relates probably to the much later tale respecting King Narathu, better known as Kalákyá Min, or the king killed by the foreigners, the splendid tragedy of which the Burmese legend makers have altogether missed. Among other legends of the time of Anawratházaw is that which tells of the capture and exile of King Manuhá of Thatón. He and all his family were turned into pagoda slaves, in which condition of hopeless degradation one of the princes died of leprosy at Pagàn. The illustrations of this legend are wanting, except in the solitary instance of the unfortunate Prince of Thatón, who is usually represented as a leper in high-class Court dress leaning on a staff. He is generally shown without either fingers or toes and with his face marked with the usual signs of tubercular leprosy.

Group III. consists of eleven Nats, whose story centres round the two kings of the Ava dynasty of the XVth century named Mingaung, a common Burmese royal title, or round the great hero Alaungsíthu of Pagàn, whose long reign covered parts of the XIth and XIIth centuries, or round King Thenzwin of Pagàn of the VIIIth century, according as we take the central heroine to be the wife of one or other of the above kings. We only know her by her title of Anauk Míbayá, the Northern Queen, which belongs to one of the consorts of every Burmese monarch. The illustrations are of heroes belonging to all the groups. No. 7, Mintará Nat, is said to have been the elder brother of the first Mingaung of Ava and to have died of fever. He is usually represented as seated in full Court costume, and winged after the Yodayá (*i.e.*, Siamese) fashion. No. 9, Shwe Nawratha Nat, is said to have been the grandson of the second Mingaung of Ava and to have been thrown into the Irrawaddy for rebellion and thus drowned. He is usually represented in high-class Court costume, seated as a Manipuri with polo mallet and ball. The modern English game of polo came from the Manipuris through English officers in quite recent times. No. 10, Aungzwámagyí Nat belongs to the period of Alaungsíthu, with a legend of characteristic royal treachery. He is represented usually as a young man in high-class Court costume, riding. No. 11, Ngázíshin Nat, Lord of the Five White Elephants, is described as belonging to the Shan dynasty of Pinyà by a confusion in the popular mind of the Shans of Pinyà with the Burmans of Ava of about the same time. He is represented as a royal figure seated on an elephant with five heads, in all the panoply of royalty that can be piled on to a Burmese king, in token of his claim to descent from all the royal lines then existing. No. 12, Aungbinlè Sinbyushin Nat, is Thíháthu, son of the first Mingaung of Ava, and is usually represented as standing in Court dress, supported on a three-headed elephant, in token of his royalty, no doubt. No. 19, Shwe Sippin Nat, belongs to the Thenzwin legends of Pagàn of the VIIIth century. His title was the Hlaingdet Myoza, and he was put to death by having his legs buried in the earth and being left to die in that position. He is usually represented as seated in high-class Court costume with an uplifted sword. No. 20, Mèdaw Shwésagá Nat, was the mother of the Hlaingdet Myoza and died of grief at the terrible fate of her son. She is usually represented as a girl kneeling in full Court dress, with her elbows turned outwards after the fashion of Burmese belles of the upper classes. No. 21, Maung Po Tu Nat is generally relegated to the time of the Shan dynasty of Pinyà, and is described as a trader who was taken by a tiger. He is usually represented as a very high official seated on what may pass for a tiger.

Group IV. consists of four Nats, purporting to be connected with the conqueror King Tabìn Shwédí of Tonghoo and his surroundings. He was the founder of the great Burman dynasty of Pegu in the XVIth

century. The illustrations of this legend are as follows:—No. 6, Taung-ngu Mingaung Nat is said to be in the story a King of Tonghoo who died of dysentery. He was in reality a subordinate King of Prome put to death by Tabìn Shwédí under circumstances of atrocious cruelty. He is usually represented as seated in high-class Court dress. No. 8, Thandawgán Nat, was the secretary of the last and died from snakebite while plucking jasmines for the king. He is usually represented in the dress of a Court official. No. 17, Tabìn Shwédí Nat, is, as his name implies, the great Tabìn Shwédí himself, usually represented as seated merely in high-class Court dress.

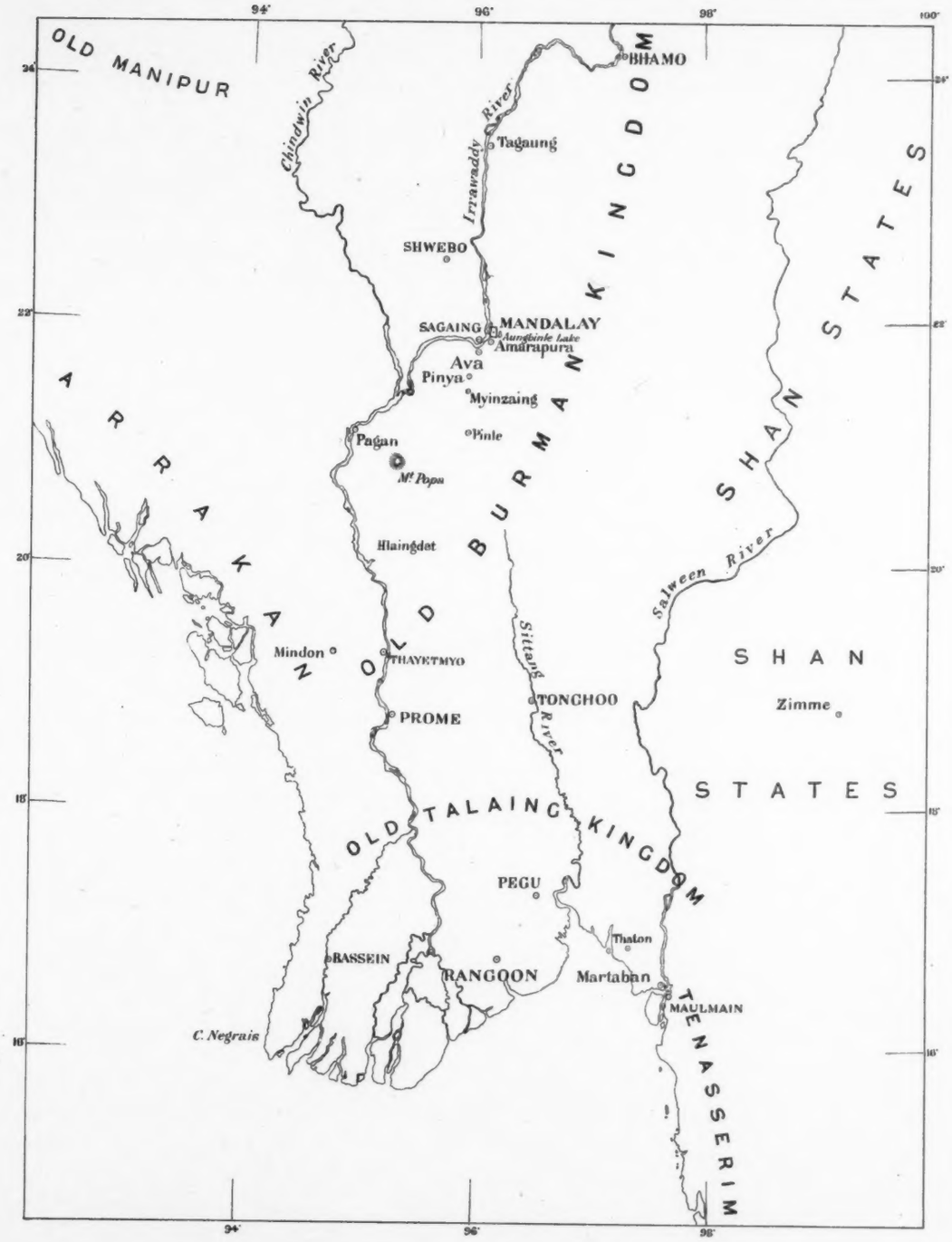
Group V. consists of four Nats of a very late date connected with the conqueror Bayìn Naung of Pegu, the Branginoco of the Portuguese writers, and his Ava-Pegu dynasty of the XVIIth century. The illustrations relate to No. 15, Shindaw Nat, a young Prince of Ava who died of snakebite while still a novice in the Hnat-pyittaung Monastery. He is usually represented in the costume of a novice telling his beads. No. 18, Minyè Aungdin Nat, a son of Anaukthalón Mintarágyí of Ava, who died of drink about 1620 A.D. He is usually represented as a young man seated in high-class Court dress, playing on the Burmese harp. No. 22, Yun Bayìn Nat, was the Chief of Zimmè, who was made a prisoner by Bayìn Naung of Pegu and died at Rangoon in 1558 A.D. He is usually represented seated in high-class costume, and in this case we have a clear reference to an actual historical expedition undertaken by Bayìn Naung in search of white elephants, in which his greatest opponents were the Yun Shans of Zimmè.

There is only one more illustration to explain—that of No. 1, Thagyá Nat himself, who is the prince of all the Nats, of whatever nature or degree, by the common acceptation of all Burmans: the No. 1 of all lists. The antiquity of his cult is indicated by his name, Thagyá, which represents the Sanskrit word Çakra, thus throwing the date of the cult back to the early times before the present Southern Buddhist (Pali) form of Buddhism prevailed in Burma and the old debased Northern (Sanskrit) form was current. The Çakra of the Indian Buddhism was the ancient god Indra of the Brahmans, the Lord of the Firmament, turned by the Buddhists into the lowest of the three great rulers of the heavens they set up on adapting the old Brahmanic cosmogony to their reformed ideas. The other two were Mahábrahmá and Mára, the Byammá Nat and Mán Nat of the Burmese. All three, both in Indian and modern Burmese ideas, descend when necessary to the earth to interfere in the affairs of men; Mahábrahmá and Çakra beneficially and Mára adversely. In the Burma of to-day Çakra as Thagyá is the Nat who most frequently does so, and he is consequently their Lord of Life, their Recording Angel, the supernatural being most reverenced and most respected. At the commencement of the New Year, he visits the earth for three days for the general good; and I well recollect that in the afternoon of the most important of these three days at the beginning of the Burmese year 1250 (April, 1888), there was a sudden and vivid flash of lightning, followed by crashing thunder, which gave great satisfaction to the people of the royal city of Mandalay, because it was positive evidence to them of the presence among them of Thagyá himself in the days of their adversity—a notion having its roots in the very foundations of Indian belief. Thagyá is usually represented in all his royalty, seated on the elephant Eyáwun, on whose august back he makes his annual visit to the earth. He bears a fan in his hand, and before him is his driver, and behind him a faithful guardian *balú*.

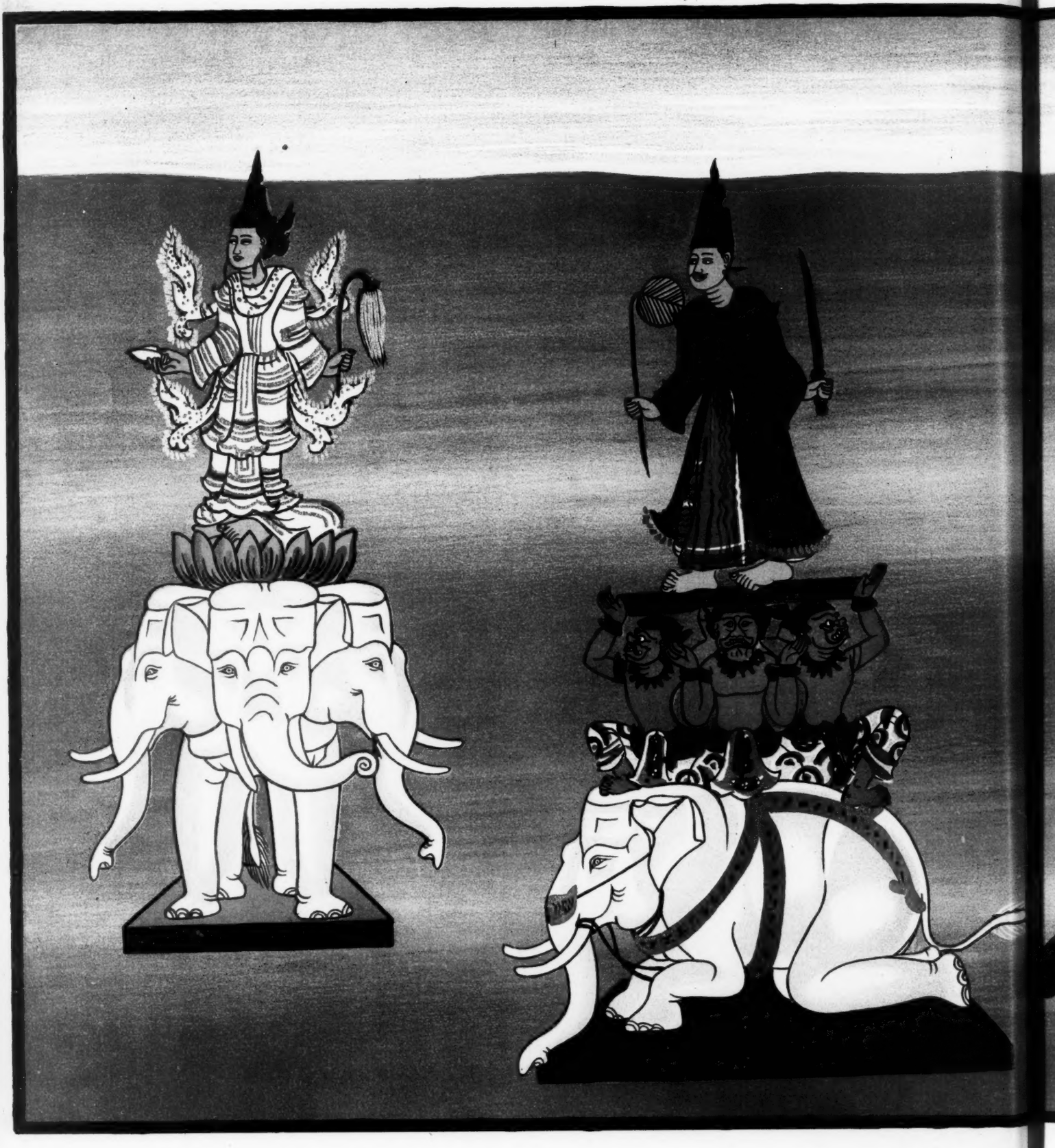
With this recollection I close this preliminary and incomplete incursion into the realm of the Thirty-seven Nats.

LIST OF ILLUSTRATIONS.

Twenty-two Nats (Royal Ghosts) of the Burmese on eleven plates in colours (Nos. 1-22). 23.—Peacock in gold and silver spangles.


94°
96°
98°
100°
24°
22°
20°
18°
16°
OLD MANIPUR
Chindwin River
Irrawaddy River
BHAMO
Tagaung
SHWEBO
SAGAING
MANDALAY
Aungbinle lake
Amarapura
Ava
Pinya
Myinzaing
Pagan
Yinle
Mt Popa
Hlaingdet
OLD BURMAN KINGDOM
SHAN STATES
ARRAKAN
Salween River
Mindon
THAYETMYO
Sittang River
TONGHOO
SHAN
Zimme
PROME
STATES
OLD TALAING KINGDOM
PEGU
Thaton
BASSEIN
RANGOON
Martaban
MAULMAIN
C. Negrais
TENASSERIM

23. Peacock in Gold and Silver Spangles raised on Cloth, made at Kemendine near Rangoon.



1. Thagyá Nat.

2. Mahágirí Nat.

3. Hnamádawgyí Nat.

4. Shwe Nabé Nat.

5. Thónban Hla Nat.

6. Taung-ngu Mingaung Nat.

7. Mintará Nat.

8. Thandawgán Nat.

9. Shwe Nawrathá Nat.

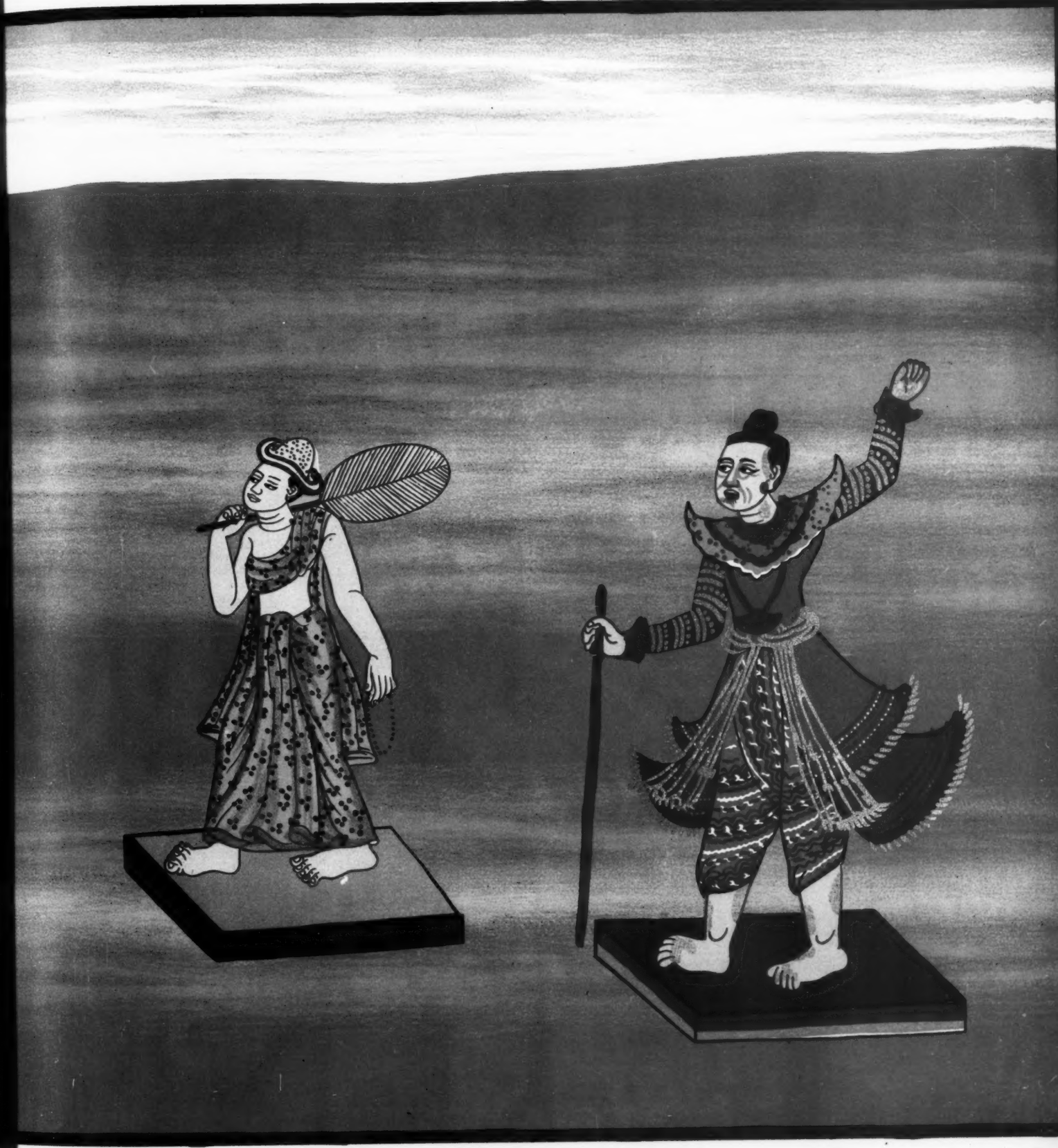
10. Aungzwámagyí Nat.

11. Ngázíshin Nat.

12. Aungbinlè Sinbyushin Nat.

13. Taungmagyí Nat.

14. Maung Minshin Nat.



15. Shindaw Nat.

16. Nyaung-gyin Nat.

17. Tabìn Shwédí Nat.

18. Minyè Aungdin Nat.

19. Shwe Sippin Nat.

20. Mèdaw Shwésagá Nat.

21. Maung Po Tu Nat.

22. Yun Bayìn Nat.

The Journal of Indian Art and Industry.

ANCIENT INDIAN BEADS.

By Mrs. J. H. RIVETT-CARNAC.

THE idea of the number and variety of ancient beads that might be collected in India, and of their possible antiquarian and scientific value, was suggested to me many years ago by a conversation with Mr. George C. Ricketts, C.B., of the Indian Civil Service, whose sympathetic interest in all connected with the people of India had enabled him to lay up a valuable store of information which was always generously placed at the disposal of his correspondents and friends. Speaking of women's ornaments, of which he had assisted me in collecting a large number of specimens, he said that in the North-West Provinces and elsewhere, the Sulaimani onyxes or Solomon's beads, which one often saw, were never shaped or bored by native lapidaries of the present day, but were found ready-made on many of the old sites. This view was fully confirmed later when I commenced making a collection of ancient beads of every description, to the significance of which amid the luxuriance of objects of interest which surround one during a residence in India, sufficient importance did not appear to have been attached. I had gathered many specimens together, and a certain amount of notes and information, but the work remained unfinished and was laid aside. A visit lately of my cousin, Colonel R. Temple, C.I.E., revived the interest, as he suggested a paper on the subject illustrated with photographs might prove of some use for comparison, and perhaps draw the attention of those interested in these ancient finds, of which many specimens exist in our European museums.

Every collector probably remembers with something akin to affection his first opportunity. Mine came to me one morning in camp, during a march through the Mainpuri district. I so well remember the hot and somewhat dusty road along which we had walked and driven, and the pleasure of a halt in a mango grove, near an old temple, beneath the grateful shade of some fine trees. A fakir, or religious mendicant, passed us on his way to the village, wearing a quaint string of beads of all kinds round his neck. The variety and large size of some of the onyxes led to a talk with the old man, who shook his head when asked if he would part with his necklace, but seemed amused at the interest it excited. When asked where he got the beads, he replied they were given to him by the village children who picked them up during the rainy season. These casual words recalled my conversation with Mr. Ricketts and the story of Solomon's beads, and suggested the idea of offering a small reward to the village urchins at our next camping ground, near which, as often during the march, a *dih* or ancient site lay close to our tents. Thus began a system which afforded us much amusement, and which opened out for us many an interest. The servants soon entered into the spirit of the chase, for it had much of that element in it. The word would go forth, at our camping grounds, that a small reward would be given for coins or for finds; the news spread, and usually by the evening a perfect brigade of urchins, big and little, intent on barter, all anxious to produce their wares, would present themselves at the camp. Coins would be warily produced tied up in the corner of a somewhat grimy head-cloth; or a handful of beads would be held out by some tiny mite, who was evidently thrust to the front as being likely to attract more favour. It was often a very curious medley of finds thus brought to view. I have seen one of the oldest Buddhist coins—a copper square coin with the elephant and *chaitya*, a beautiful and rare gold Gupta, belonging to the great dynasty that reigned as far as Patna, a copper coin of Constantine the Great, struck when he took the phœnix as his emblem, and some mud-encrusted beads, all offered at the same moment, on an outstretched palm, and found at Bhitri in the Ghazipur district, the site of the celebrated inscribed Buddhist pillar. Year by year accompanying my husband on his cold-weather tours through the N.W. Provinces and Oudh, my collection increased, friends interested themselves in the subject, sending me many contributions and much interesting information. Thus was formed a somewhat quaint assortment of ancient beads, which became a source of interest and amusement, besides promising to shed some light on what may be called the antiquarian as well as the ornamental side of this class of relics. Seventy-eight strings, amounting to some hundreds of beads was the result; of these sixty-one have been chosen and arranged to be figured in 12 plates, which accompany this paper, the remainder being distributed among various collectors, and museums.

FIND-SPOTS.

The find-spots and localities from which specimens were produced may first be noticed. Speaking generally, our winter tours during a series of years took us through all the districts of the North-West Provinces and Oudh. It was thus our good fortune to pass through much interesting country. Along the line of the Gogra, the

Gangetic valley and the Jumna, were the traces of the early Aryan advance and civilisation, with its super-imposed Buddhist faith. Here the local names of Díh, Khera, Kot and Vihara (monastery), applied to ruined mounds of vast extent, near which nestled or on which were built modern hamlets or villages, brought home to me the history of the past; while in the hilly country of Mirzapur, kistvaens and tumuli, with their contents—stone implements, and earthenware vases—as also the stone implements in the Banda district, bore evidence to the sweeping back of the aborigines into hilly fastnesses before the Aryan wave of invasion. The Gorakhpur and Basti districts, in which the ruined mounds of Rudrapur, Khukhundu and Sohan Kot in the neighbourhood of the sacred ground where Buddha was born, lived and died, yielded their quota of interest. Ghazipur, 40 miles from Benares, the great sacred city of the Hindus, lies in the midst of country once ruled over by the Gupta dynasty, which stretched its power as far as Patna, and the famed Buddhist monarch Aśoka had many an inscribed pillar or *lât* scattered through this district. Here we first began a collection of coins, which in gold Guptas we were fortunate enough to make almost complete, and which is now in the India Museum as the Rivett-Carnac Collection, and there also was opened up a field followed up through Oudh and the North-West generally of find-spots for coins belonging to old and almost unknown Hindu dynasties, besides early Buddhist, Greek and Indo-Bactrian varieties. As will be seen, Ranki to the north of the Sai river, near the border of the Rai Bareilly district, abounding in ruins of an ancient Bharodhi town, and Karauli on the banks of the Ganges, almost opposite the town of Shahzadpur in the Allahabad district, furnished me with many specimens of beads. Kanauj, once the capital city of another great Hindu dynasty not far from Cawnpore, around which spread débris and mounds of considerable extent, was a most favourite hunting ground for curios of all sorts. But some of the best specimens came from Sankisa, Sarai Aghat and Behar Khas, all ancient sites in the Farrukhabad and Mainpuri districts further north. Sankisa was most holy ground to Buddhist worshippers, for it was there Buddha descended from heaven after his ascent, to instruct his mother in the teachings of the Law; and tradition still tells of the crystal, golden and silver stairways by which he returned to earth. Behar Khas bears in its name alone evidence of its Buddhist origin, as Behar is but a variant of Vihara, or monastery. From Akbarpur, Tikrí, Faizabad, Ajudhya (where once reigned Rama), in fact, wherever our camp was pitched and wherever friends could help, came in sometimes by two and threes, sometimes in rich batches of twenty or thirty at a time, these waifs and strays of the past. Much importance cannot be attached to the mere find-spots, as beads might be carried far and by no means belong to the localities indicated; but on one or two occasions undrilled specimens were brought in, suggesting that possibly there had been a local industry.

MATERIAL AND WORKMANSHIP.

It may be roughly said that crystal, onyx and cornelian are chiefly represented in this collection; but amethyst, topaz, garnet, glass of almost every hue, clay, agate, shell, lapis lazuli, and what to an unscientific eye might be classed as pebbles, are all placed under contribution. It may, perhaps, be of some interest if this collection in its variety were to be examined by an expert. There might be stones unidentified which belong to certain areas or geological formations, showing whence they were derived. The peculiarity of the drilling of these ancient beads was pointed out to me by Mr. W. Cockburn, who kindly helped me in the Gorakhpur district. He drew attention to the fact that corundum must have been used, and from the formation of the holes, he inferred a soft drill must have been worked with some hard powder, as the bases of many unfinished holes are flat, not pointed. He inferred from this that the process must have been long and tedious, and have rendered the beads when finished valuable. The high polish on some of the crystal and cornelian specimens, he believed, could only have been produced by a substance known to lapidaries as "tin putty." I had early remarked myself that, in endeavouring to re-string many of the specimens, the borings had been pierced from either end, and the junction was not exact. The only way to succeed was I found to hold the bead up to the light and work the thread up or down according to the lie of the light. An inspection of some of the crystals will show plainly this peculiarity in the drilling. That there was an ancient trade in onyxes, Ball, in his *Economic Geology of India*, brings out. He writes: "As far back as the first century the author of the Periplus of the Red Sea mentions the onyx among the products of Plythanæ, a locality which may probably be identified with Paithon on the Godaveri, where agates are obtained even at the present day. He further states that the onyxes were taken down to Barygaza, the modern Broach, where a great trade in agates is still carried on. It appears that the lapidaries of Broach and Cambay are now supplied with raw stones chiefly from Rautanpur, in the territory of the Rajah of Rajpipla, where the gravels are systematically worked for the sake of their agates, jasper, onyx and other silicious stones." It would thus appear that from very early days onyxes were regarded as valuable, and the fact that the Indian lapidaries in past ages were famous for them, helps to account for the vast supply of these beads found on all the old village sites. The Sulaimanis are well known everywhere, and the Delhi jewellers always say they collect them from the villagers and never buy the rough onyx. They have often for sale superb

necklaces of these stones. One sold some years ago at Simla, of well-matched beads, cost over Rs 300; each bead was fluted, and this, I well remember, the jewellers owned was done by themselves, but they maintained they had collected the onyxes ready drilled from the old village sites. A well-known European merchant at Simla, who deals largely in curios, and who was discussing this fact some years afterwards, corroborated this statement of the Delhi jewellers in regard to the find-spots of these onyx beads, and added the quaint information as to the reason for the name "Sulaimani," or Solomon's beads. In the days of King Solomon, so runs the legend, the genii presented him with a fresh rosary every day, to tell his prayers by; hence the vast quantity of them scattered over the country.

SHAPES AND ORNAMENTATION.

The variety of shapes is great, and difficult to explain without illustration. It would appear as if the material used decided in some measure the form. It may be briefly noted here that the types are the ordinary polished and unpolished round beads, varying in size from large marbles to pins' heads; oval-shaped ones, long and short, both dull and polished, from the size of a pigeon's egg to that of a bean—many of these being hexagonal, rough prisms pierced lengthwise; cylinder-shaped, round facetted, cubes, fluted, cushion-shaped, pear-shaped pendants, wheel-shaped, discs—an infinite variety of forms found in an infinite variety of material. Besides these are a few beads, about 35 in number, of an entirely different type. These are the enamel specimens, to which Prinsep, in his *Indian Antiquities*, first drew attention (pls. 4 to 13), and will also be found figured and described in "Finds at Sankissa" (Rivett-Carnac), *Journal A. S. B.*, Part I, 1880. This enamel class is said to be amongst the most ancient form of ornament, and their rarity in comparison to all other types is remarkable. They may be divided into two classes—the white enamel on a black or carnelian ground, and black enamel on grey or white agate ground, and into three types—the long oval shape, the round, and the disc. The enamel patterns are chiefly pentagonal, hexagonal, circles with dots in the centre, or else five rows of tiny spots, or bands two or three in number running round the beads. The reiteration of these forms is curious; the circle and dot pattern is so arranged on the round beads as to form the triad symbol, to which attention will be drawn later. Most of these enamel specimens, as will be seen by a reference to the plates, come from the Buddhist sites. My brother, Colonel Algernon Durand, in describing the women's ornaments in his book, *The Making of a Frontier* (p. 208, with plate), remarks:—"The beads, more especially the long ones, are practically replicas in metal work of beads dug up on the sites of ruined Buddhist cities in India. So marked a persistence in design would go to prove a connection between races employing them in the common objects of everyday use." The silver long-shaped bead here alluded to has its exact counterpart in the black oval specimen with white enamel design figured on Pl. 25, fig. 9 of this collection. The one carnelian disc ornamented with a white enamel design quite peculiar to itself requires some little explanation. It was brought to us at Kanauj, and is figured at Pl. 25, fig. 7. The central ornament is a cross with a dot between each arm; the pattern round the edge consists of seven half-circles with a dot in the centre. The design is the same on both sides of the disc. No similarly ornamented specimen was ever brought to us from the many find-spots in India, but Colonel, Sir Edward Durand, while on the Afghan Boundary Commission in 1884, sent me an almost identical carnelian disc ornamented in white enamel from Kuhsan. The design was slightly different, consisting of a central white dot surrounded by a circle of eleven dots; outside these again a circle of eight crosses and a border ornament, which might represent ten ill-formed crescents. Of enamel pear-shaped pendants only one was brought to us—a carnelian or agate of a yellowish hue (Pl. 32, fig. 47). The white enamel pattern on this consists of three triangles point downwards, which will be noticed later as having some significance. The more one examines these enamel beads, one is struck with the delicacy and accuracy of the workmanship; both in the geometrical designs and in the very graceful curves of the white bands, on one or two specimens, daintiness of treatment is manifest. It would seem as if there had been some strong incentive to cause small pieces of carnelian and agate, or whatever the black material may be, to be thus chosen out for what must have been a laborious if not costly method of ornamentation.

There is yet another class of enamelled or marked types to be noticed, and these also seem rare. They are the round black or blue-black specimens. Of these, about eight in all appear to be black glass, grooved, and the lines are generally spiral. In one bead, the remains of red enamel can be seen (Pl. 24, fig. 1). Two others of this class are, however, different in treatment; the one, apparently black glass, has white circles with black centres standing out in relief on the bead, the circles being arranged triad fashion (Pl. 31, fig. 44). The other is equally striking; the blue-black material at first sight looks like some dull black stone, but on closer examination the red of a hardened and coloured clay shows through. The design is the same white circles with a central black spot. The pattern is, however, not in relief. Again the disposition of the circles appears to take the triad form (Pl. 30, fig. 39).

Besides the enamelled and circle-and-dot marked types, two curious specimens remain. In these the regularity of the pattern is puzzling. The one, a long oval brown agate, about 1¼ in. in length, has what is known as the key or Greek pattern in a white band running round the cylinder, with a white square and dark central dot in each curve. It looks as if advantage had been taken of the white and dark lines of the original stone, but the design if natural is peculiar (Pl. 30, fig. 39). The pattern on the second, a brown agate also, is even more regular, a curved brown band in the centre being picked out with white at either end. The effect of this band is to convert the white ornamentation at either end into three white cones rising out of a similar circle. It would seem as if some artificial means had been taken to work out this pattern. In Europe it is said the regularity in the white and black onyx beads is secured by some artificial process, and this would seem to have been done here.

The carnelian pendants shaped like arrow-heads, of which there are four specimens only, next attract attention, as they have been carefully worked and polished. Further, anyone looking through the plates will be able to see that both in shape and in treatment there is a good deal of variety—some specimens being very roughly hewn, dull and unpolished, and others bearing traces of careful manipulation.

SUPERSTITIONS AND RELIGIOUS SIGNIFICANCE.

There remain now to be noticed the superstitious and religious significance attached to these bead finds in India. Mr. Crooke, of the Indian Civil Service, who is well known as an authority on Indian folklore and cognate subjects on which he has written several interesting works, most kindly helped me in my quest, and an extract from a letter of his on the subject, written in 1885, sums up the chief points. He said: "As to the popular idea about beads, I believe they may be divided into two classes—those merely made for personal ornament in which the intrinsic beauty is the sole element, and those used with some underlying religious idea. I believe those 'religious' beads may be roughly divided into two classes. First, those in which the shape or colour of the bead has some significance; and secondly, those used as talismans. We know that the Hindus connect certain precious stones with certain gods, planets, astrological signs, &c. It is in the intense belief of Hindus in the power of the 'evil eye' that we must look for the reason why most beads are worn. The idea is, of course, that if a child or person wears some conspicuous ornament on its body, the eye of an unlucky person is likely to fall on that first. The beads worn by children are always, I suspect, worn with this motive. In this case the chief point is that it should be of conspicuous colour or shape, and I believe that in most cases this is considered enough, and that minute shades of colour or varieties of form are not so much attended to. But at the same time there may be some vague idea that the bead should at least in colour approximate to that of the stone sacred to the particular god, planet, &c., whose evil influence the wearer hopes to avert."

Perhaps before endeavouring to separate the specimens under the headings given by Mr. Crooke, it may be advisable to notice the class by whom these beads are chiefly worn. Mr. Cockburn, who assisted me and took much interest in the subject, informed me that the country people themselves regarded these beads found on the old sites as uncanny, and never wore them as ornaments, only as talismans. Evidently the fakir, to their minds, being a past-master in mystery, could ascribe to the beads their proper occult virtues. They were taken to him when found, worn by him, and rendered serviceable through his agency. Mr. Cockburn held that the Muhammadan fakirs alone wore this class of ornament, in imitation, he believed, of the Hindu mendicants, who wore *rudrakhsha* or *tulsi* necklaces, or those made from other sacred plants, trees, berries, or grasses. The Hindus wore these natural products of the forest, and used them as rosaries. The Muhammadan fakir, equally living on the credulity of the people, and anxious to impress, but not being restricted like the Hindu to certain materials, found the ancient beads useful as rosaries and still more useful as enabling him to attribute to them occult powers. The legend of Solomon's rosaries applied to onyxes, seems to give colour to this view. For Solomon to the Muhammadan is a master of wisdom and necromancy. The Muhammadans, as is known, borrowed from pagan sources. The Kaaba stone, so sacred in their eyes, is said to be but a survival from a more ancient cult, and the so-called Solomon's Seal symbol is one used in Surya worship by the Hindus in the present day.

That some of the beads, both in shape, colour and ornamentation, may have had, as Mr. Crooke expressed it, "some underlying religious idea," seems probable. Several of the round enamel specimens and two black ones bear the circle-and-dot pattern. This symbol is recognised at the present day in India as the sign of Mahadeo, the Great God—the name by which Siva is best known amongst the people. Moor, in his *Hindu Pantheon* (p. 405), dealing with sectarial marks or symbols, says of the circle and dot: "My pundit fancied this circle and dot to have very profound relations: he called the dot 'purma,' a point, typical of the Deity; having neither length nor breadth; self-existing—containing nothing; the circle, he said similarly, was Brahm—without beginning or end—unity—perfection." This symbol again, three circles and dots placed triad fashion, is said to represent the Trimurti, or Hindu triad—Brahma, Vishnu and Siva. And it will be seen that this circle-and-dot

pattern has been carefully adjusted on the specimens alluded to, both in the delicate enamel, and in the black and coarser designs, so as to present the triad symbol whichever way the bead lies. The triangle, again, is the recognised emblem of the Trimurti, and the quaint carnelian pyramid-shaped beads scattered through the collection may have been worn with some religious motive. Mr. W. Cockburn, referring to one of these, remarks that it represents the Trimurti, and is always used as a charm against *nazar*, or evil eye; and that cloth bags of this form are hung round the necks of children. On an old vase found in Lahore in 1857, and described in the Asiatic Society's *Journal* (Part II), Buddha, who is supposed to be represented seated in a chariot, it is noticed, wears "a *mâla* or necklace of gems, probably of amber or turquoise, of the shape of truncated cones, strung transversely through the thick end." This form of ornament is therefore, at any rate, sufficiently ancient. In Hindu symbolism, the triangle, apex upwards, represents Siva, downwards Vishnu.

The discs large and small, and some beautifully polished, have also to be noticed. Their shape is peculiar, and there is a considerable variety of material employed—crystal, onyx, bloodstone and carnelian. These chiefly came from old Buddhist sites, and at Sankisa especially were associated with quantities of clay discs, brought to us there, of the same types exactly as the "spindle-whorls," or ex-votos, described by Schlieman as found at Troy. This suggests that they may have been used as ex-votos.[1]

In regard to crystal specimens, the religious attributes of crystal are twofold. Crystal is alluded to by H. H. Wilson as "The moon-gem, which is supposed to absorb the rays of the moon and to remit them again in the form of pure and cool moisture." It is therefore sacred to the moon, but is also sacred to the sun and used in Surya worship. The crystal beads used in Surya worship ought each to be a burning-glass; these, however, as may be imagined, are extremely rare, so worshippers have perforce to be content with ordinary specimens. Crystal is also held sacred by the Buddhists and noted amongst the "Seven Jewels." In the famous Sopara Tope near Bassein, where relics of Buddha were discovered, Mr. Campbell mentions in his report that forty-four beads were found, three of which were crystal; and Rajendra Lalla Mitra (*Indo-Aryans*, Vol. I., p. 253), alluding to materials to be used as auspicious for seals, whether "metal, stone or wood," dwells on the necessity of using the material sacred to the planet which presides over the destiny of the person concerned; but adds, "Crystal forms an exception to this rule, and is reckoned fit for use at all times." Thus the sacredness of crystal in the eyes of Indo-Aryans, Buddhists or Hindus may perhaps account for the large number of beads of this class found on old sites.

The stones and colours sacred to the different planets are:—

Sani.	Saturn.	Sapphire.	blue.
Sukra.	Venus.	Amethyst, Jacinth.	red.
Vrihaspati.	Jupiter.	Carnelian.	grey.
Buddha	Mercury.	Touchstone.	black.
Mangala.	Mars.	Bloodstone.	green.
Chandra.	Moon.	Crystal.	white.
Surya.	Sun.	Topaz, Diamond.	yellow.

The connection with the god-planets invests these materials not only with a sacred significance but with talismanic virtues. This brings one to the talisman type of ornament, and the dread of the "evil eye." In this evil eye superstition there seem to be two counter-currents—one the dread of an active maleficent influence, the other the fear that perfection brings with it ill-luck. It was mentioned to me as a curious custom, that no native scribe would ever send in a piece of writing without a blot, or deliberate imperfection introduced somewhere, as, if the writing were perfect, bad luck would follow. Similarly, in all embroidery or ornament, some fault is purposely introduced to ward off ill-luck. Those who have bought Indian *phulkaris* or worked cloths may have noticed how a portion of the pattern is left unfinished with the same object. Mr. Crooke, in his letter quoted above, has alluded to the intense belief in the power of the evil eye amongst Hindus as one of the reasons for the wearing of beads. Mr. W. Cockburn, when sending me the six ancient beads (Pl. 28, fig. 27), wrote: "They are used to tie round the ankle in certain diseases, also to keep off 'Nazar,' are regularly worn by fakirs, and I conclude are thought something of. The man who brought me the long bead had it carefully wrapped up in a piece of cloth, and made me a present of it with great form." Mr. Cockburn further informed me that blue was the chief colour antidote to the evil eye; that anything from the sea was considered sacred and pure, and thus shells especially could be worn by everyone as a protection against this danger. Blue being a sacred colour would also seem to account for the value set on lapis lazuli, of which many finely polished and unpolished pieces occur in this collection. The necklace of over forty pieces (Pl. 34, fig. 56) was sent me from Sohan Kot by Mr. Cockburn, who said that there must have been an extensive local manufacture, he thought, in this place, as he found a good quantity of broken pieces of this stone. A pundit whom he consulted told him the native name for lapis lazuli

[1] See Memorandum on clay discs called Spindle Whorls, Rivett-Carnac, *Journal of Asiatic Society Bengal*, Vol. XLIX., Part I., 1880.

was "Nau-i-lam," which was translated as "a master of nine," not "Nilam," sapphire. Its influence, as explained by the pundit, was above that of the nine gems, and wearing it alone was as good as wearing the nine gems. It is the great protector of women with child. Natives value it greatly and wear pieces around their waists as protection against all forms of evil. Mr. Cockburn procured a piece thus worn round the waist from a Bhar, one of the aboriginal tribes. The legend connected with this stone, told by the pundit, was that a certain raja had two wives. The one that was not with child endeavoured to destroy the unborn child of the other by means of spells, but the husband managed to steal a "Nau-i-lam" (lapis lazuli) bead from the neck of the goddess Pàrbati to counteract the spells. The wicked wife managed to get possession of this bead, broke it into pieces and threw it into the river; but the atom split into myriads of fragments, and mixing with the sand formed a rampart of mountains to defend mother and child. To corroborate the truth of the legend, the pundit drew attention to the particles of sand shimmering in the lapis stone. Apparently, besides this belief in lapis lazuli, blue beads are much in demand in the bazaars, and large blue glass ones are specially sold to be worn by horses. The superstitions in regard to horses and their markings are innumerable, and they are supposed to be susceptible like human beings to the influence of being "over-looked," as it is called in Europe. A curious proof of this came under our own notice, in the case of a favourite horse. He had been left behind ill; on his recovery he was marched in one terribly hot morning when the much-dreaded *lu* (a severe form of the ordinary west wind) was blowing. Noticing three white beads round his neck, the groom explained they were the cores of onions strung and put round the horse's neck to save him from the pernicious effects of the *lu*. White beads not being handy it was considered the cores of onions were as efficacious.

White beads made from the bones of the *gadur*, or flying-fox, are also worn. Their efficacy against rheumatism and aches and pains of the joints are firmly believed in. An old woman-servant of mine always wore a string of them. Having lost her *gadur* beads whilst with me in the Himalayas, she sent down to the plains for others, as they could not be procured in the Hills. She declared her aches and pains returned directly her beads were lost, and vanished when she was able to wear them again. One of these *gadur* beads is figured on Pl. 26, fig. 16.

Carnelian, of which a good many specimens have been gathered together, are worn, amongst other reasons, to ensure wakefulness. Some of the carnelian hexagons sent me from Karauli were specially mentioned as having the value of securing immunity from fatigue, and wakefulness to anyone forced to sit up at night. These carnelian beads are also supposed to have curative qualities in regard to dysentery and hemorrhoidal diseases.

The most striking, however, of these talismans are the large oval ones. They were brought to my notice for the first time when we made the purchase of the dark green specimen (Pl. 27, fig. 22). Immediately this was shewn to a native *ayah* (or maid-servant) she called it a *Khas muhr*, a bead used in childbirth to ensure the mother's safety and to allay suffering. She said that such beads were lent out by fakirs, who were always the possessors of them, and who never accepted money for the loan; and she further pointed out that the bead in question was worn and flattened by constant use. She added that before the birth of a child she had worn a similar bead, that it had allayed her pains and facilitated the child's arrival. Another native woman, to whom some of the large oval onyxes were shewn, called them *Jehur muhr*, and said they were tied on the parts affected as cures for abscesses and boils; that not long before she had herself worn one for an abscess on her thigh, and had received great relief from wearing it. She also recognised the value of this type of bead and their use in expediting delivery in childbirth. *Jehur muhr* may possibly be a corruption of *Zahr* (poison) *muhr* (rubber), a porous grey stone said to be an antidote for snake-bite, and which is known as the *bezoar*. Of these large oval beads there are fourteen specimens, and they are mostly of onyx or agate. They may be easily recognised by their shape, and by one side being usually much worn down. This has probably been caused by their having been used to rub affected parts. One of these, a beautiful specimen (Pl. 27, fig. 19), has three curious circular markings lying along the oval triad-fashion. Another has the crescent with a circle and dot incised on it—a Shivite symbol. Egg-shaped agates and marbles undrilled, many about the size of these drilled specimens, are exposed for sale on stalls in Benares and elsewhere near the temples, and are used as Mahadeos, to be placed in the brass lotus shrines so common in Benares, and in other receptacles used in Mahadeo worship. Besides the large oval onyx beads, three round ones (Pl. 27, fig. 22) marked with pieces of red cloth and numbered 1, 2, 3, were picked out as being (Nos. 1, 3) good for ophthalmia, while the grey agate or onyx (No. 2) with delicate markings was called *Kunja* and declared to be good against the worst form of itch—not the dry itch, it was carefully explained, but the form that runs into sores.

The strings described above were all found in the Gangetic valley. The collection which has been figured, however, contains five other necklaces brought, four of them from other parts of India, viz., Gilgit and Kumaon, and one from Egypt, and this brings the subject to the similarity between the beads found in India and those of

other parts of the world, not only the similarity in material, shape and ornamentation, but also in the superstitions relating to these talismans. The rough amber necklace (Pl. 34, fig. 58) was bought from a hill-woman in Kumaon (Himalayas), and was strung exactly as it is now, the only additions to it being three gold fluted beads bought subsequently. It was not till many years later that facsimiles were seen in Brittany, one in the possession of M. le Comte de Limur and one owned by Comtesse Dillon. These necklaces, we were told by their owners, are heirlooms amongst the Breton peasants and are lent out from house to house in cases of sickness and imbecility, both for adults but more especially for children; and money is never taken in exchange for the loan of them. Amber from earliest ages has been held in great esteem, and lately the Zurich Museum has become possessed of some magnificent amber necklaces found in ancient graves.

The lapis lazuli necklace from Egypt has been introduced to show the similarity in treatment of the long polished beads with some of those found on the old sites in India. The three strings of more modern-looking beads from Gilgit have been chosen, the one on account of the curious shape of the seeds or clay beads employed, the other because of the large white bone or shell plaques, and the third because of the jade central ornament. Jade is sold at the present day in the Indian bazaars as a specific against kidney disease. Muhammadans wear it as pendants or amulets inscribed with passages of the Koran. Miniature jade hatchets are sold in Burmah as charms and talismans. And in the Auray Museum in Brittany, a necklace of beads found in one of the tumuli in the neighbourhood has a miniature jade hatchet as a central pendant. In Peru, far removed from India and Burma, jade was highly prized.

But what is yet more remarkable is the curious similarity in the beads found in the grave mounds in Europe, the British Isles, and America with those found on ancient sites in India. At Auray, near Carnac in Brittany, my attention was first attracted to this similarity, and I noted that there were the old melon-shaped fluted glass beads, which looked dimmed as if rolled in the sea, the clay, crystal, carnelian, oldest of all, enamel beads, and quaintest of all the miniature jade axes pierced as pendants. In *Grave Mounds and their Contents*, by Llewellyn Jewitt, occurs a passage concerning Anglo-Saxon finds which might easily apply to those found in India on these old sites. He says: "Amongst the most profuse of Anglo-Saxon remains are the beads and necklaces of glass, amber, and of other materials, many of which are of extreme beauty. The greater part of the beads which are found are composed of glass, transparent and opaque; variegated clays of different colours; and of amber. Less frequently beads of amethystine quartz, of crystal, and of other rare natural substances are found."

In *Remains of Ancient Saxondom*, by Akerman (Pl. XII.) is figured a string of coloured beads from a grave near Stamford in Lincolnshire, one of which, the eighth from the left, a dark blue with a dull white circle, closely resembles the dark blue clay bead referred to as bearing the triad sign (Pl. 31, fig. 39), and of this type I have seen a similar one in a book on Russian antiquities. The uncoloured string of beads at page 28 of the same work, found at Welton, Northamptonshire, closely resembles those found in India. Maurice, in his *Indian Antiquities*, Vol. VI. p. 161, draws attention to the fabulous stone of the Druids. The chapter is headed "The Anguinum or Serpent Egg of the Druids." Reference is made to the serpent being a symbol in "the mysterious rites of Druidism." "The anguinum was a charm of wonderful power, and constantly carried suspended from the neck or the bosom of the Druid." Pliny has described its formation from the saliva and sweat of an infinite number of serpents intertwined, and Toland says "that it was called in British 'Glain-neidr,' or serpent of glass." Mr. Toland, in addition, says "that they were worn about the Druid, as a species of magical gem; that they were in fashion either perfectly spherical or in the figure of a lentil, and were generally made of crystal or agate." Maurice also draws attention, at p. 166, to "the practice as common to Brahmins and Druids of using consecrated beads in their worship of the Deity."

A reference has been made to the shrine and egg used in Mahadeo worship in the present day in India. At p. 147 of *Grave Mounds and their Contents* is described, amongst other things found at Avisford, "an oval dish with handle containing a fine agate." The sketch of the oval dish has some resemblance to the oval stands made of brass, to be seen any day in Benares. The *Zahr muhr* or Bezoar stone, which has already been mentioned as regarded with some reverence in India, is referred to in Squier's *Peru*, p. 91. He says that the Bezoar stone (*quicu*) along with quartz crystals (*guispi*) are amongst "the most esteemed household deities of the ancients."

The Japanese have also their peculiar charms or ornaments called "Magatama" and "Kudatama." In an article on "Stone Implements of Asia," by Prof. P. H. Fischer of Frieburg in Baden, published in the *American Antiquary* (pp. 27, 28), he thus describes them:—"The Magatama are semi-lance shaped beads and are usually of nephrite, crystal, agate, serpentine, amethyst, jasper, or sometimes soapstone and clay. The Magatama is one of the three insignia of the Japanese Emperor. The Kudatama are jewels of a cylindrical form, and both are put into earthen vessels and placed in the grave of the dead."

When to these similarities is added that the Lenape Indians of North America recognise a circle and a dot in the centre as the sign for "spirit," or, according to its size, "the Great Spirit," we have yet another curious link with India and the Mahadeo symbol. This is referred to in Brenton's *Walum Olum*, Vol. V. 119, p. 408; and *Science*, May 15, 1885. Enough has perhaps been said to draw attention to this interesting subject of bead finds. Could some of these beads speak, a strange chorus of hopes, fears and thanksgivings might rise from these far-scattered emblems common to so many races of the earth. As Frederic Robertson feelingly puts it, "Superstition is the refuge of a sceptical spirit which has a heart too devout to be sceptical." If to this are added the wise words of Sir Henry Holland regarding collecting, some excuse may perhaps be made for this somewhat lengthy paper. "The interest," he said, "is one which augments with its gratification, is never exhausted by completion, and often survives when the more tumultuous business or enjoyments of life have passed away."

MARION RIVETT-CARNAC.

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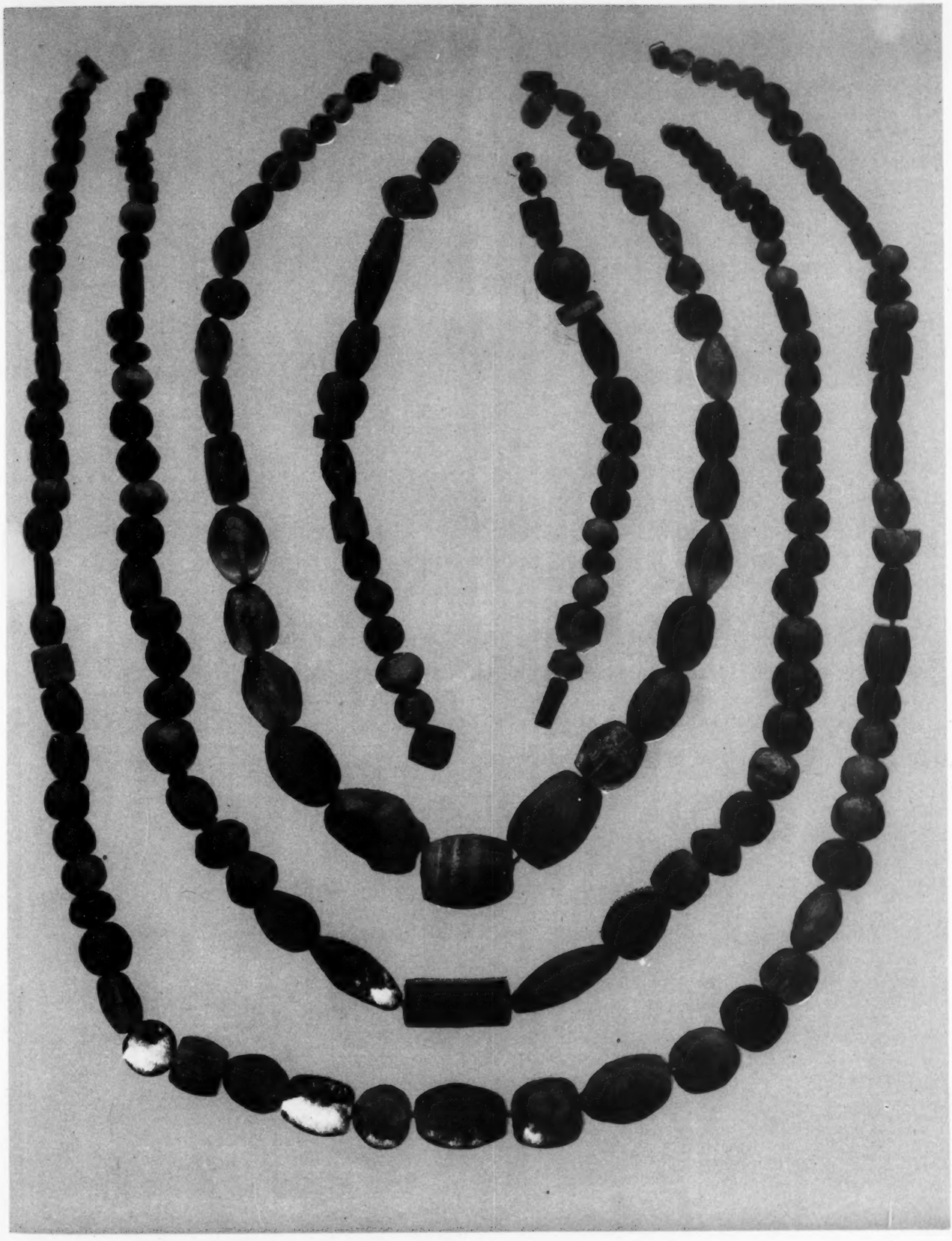

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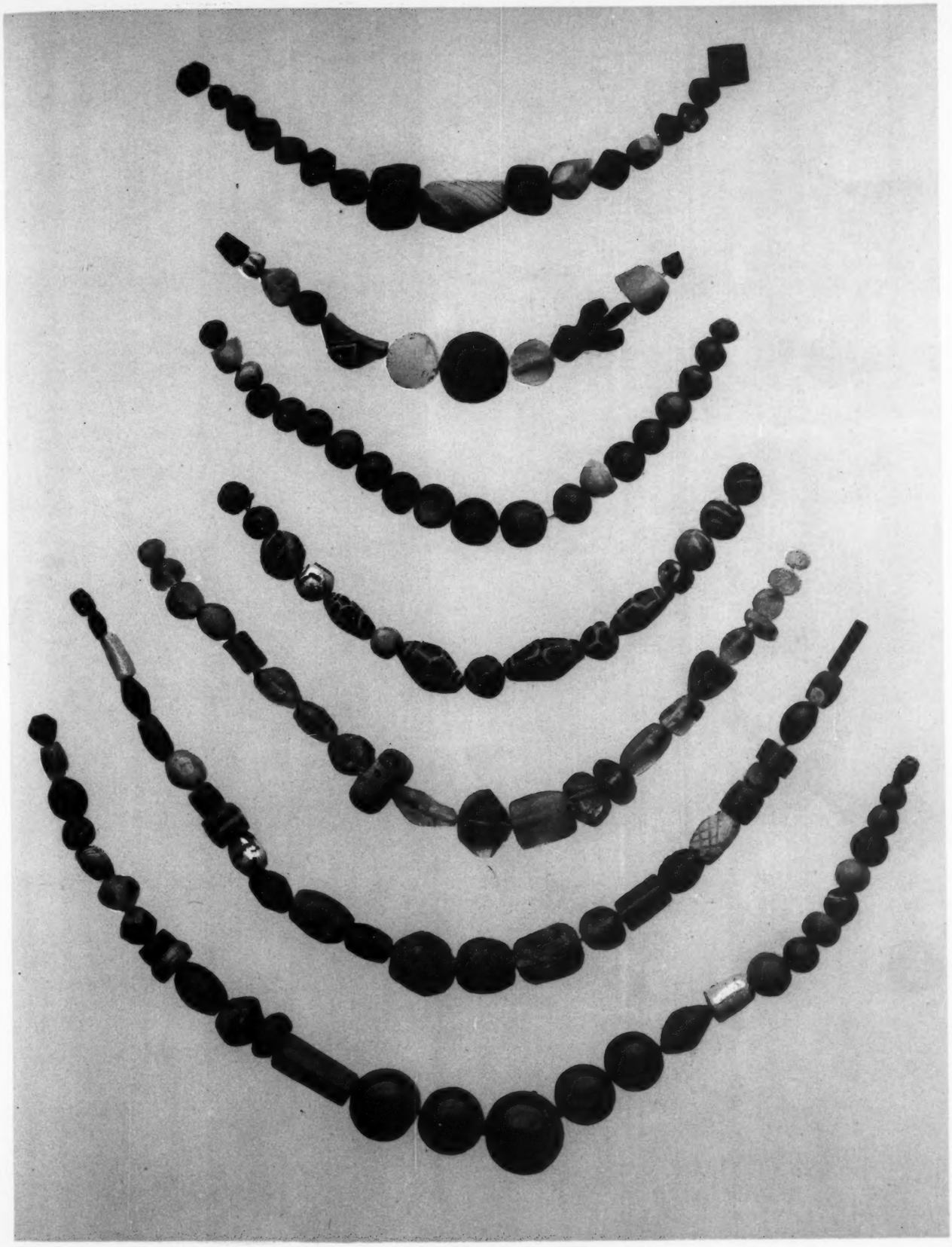

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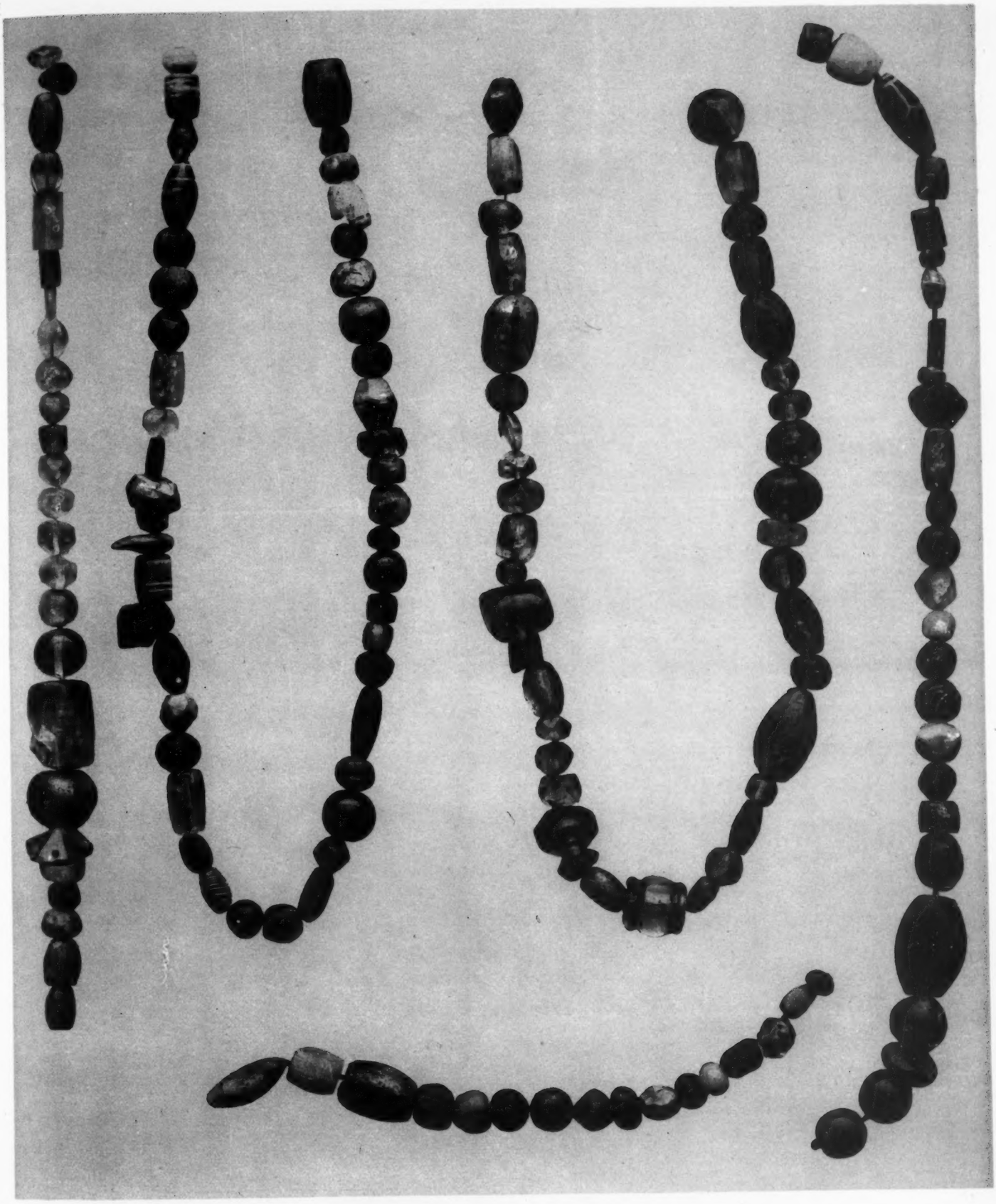

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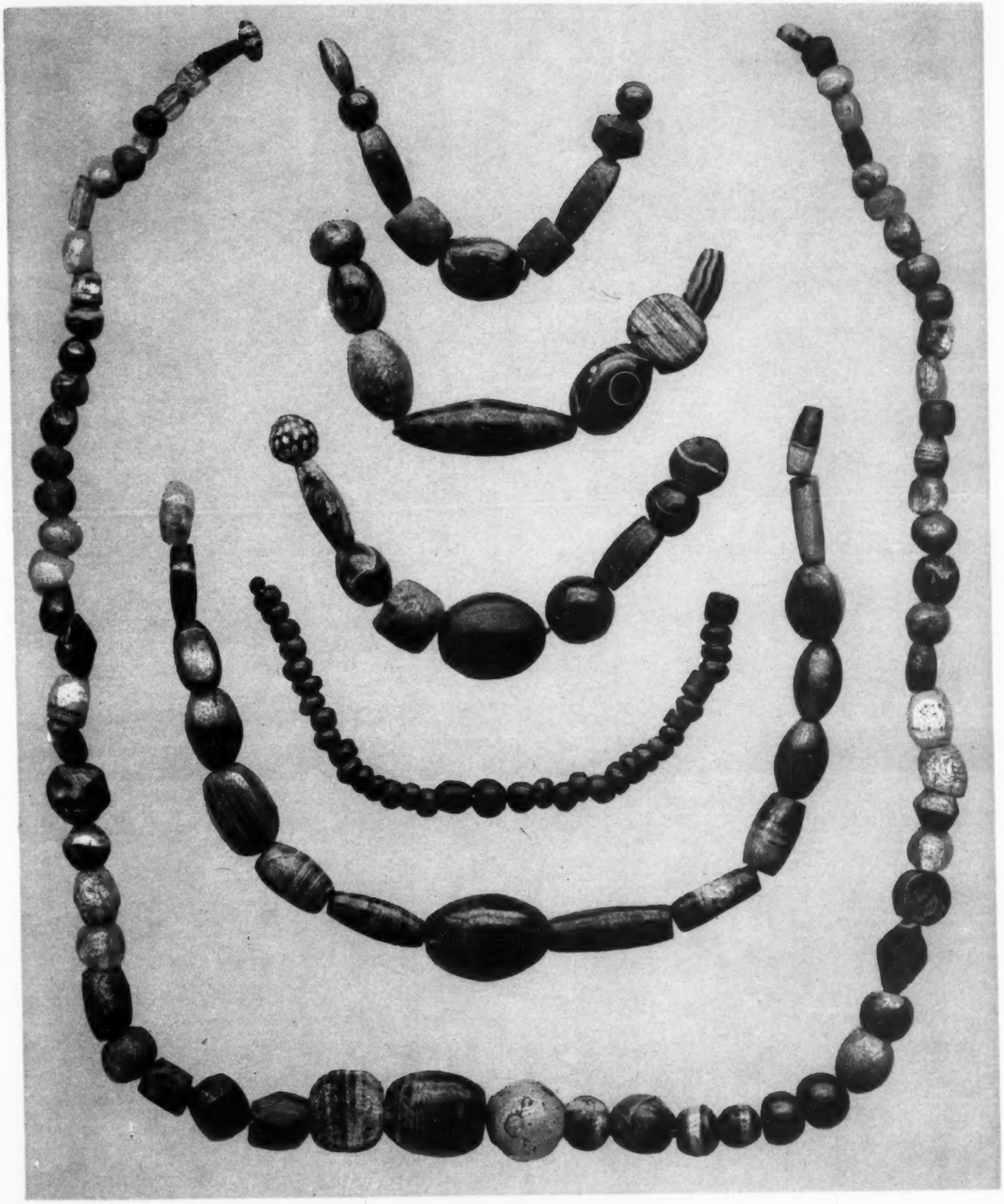

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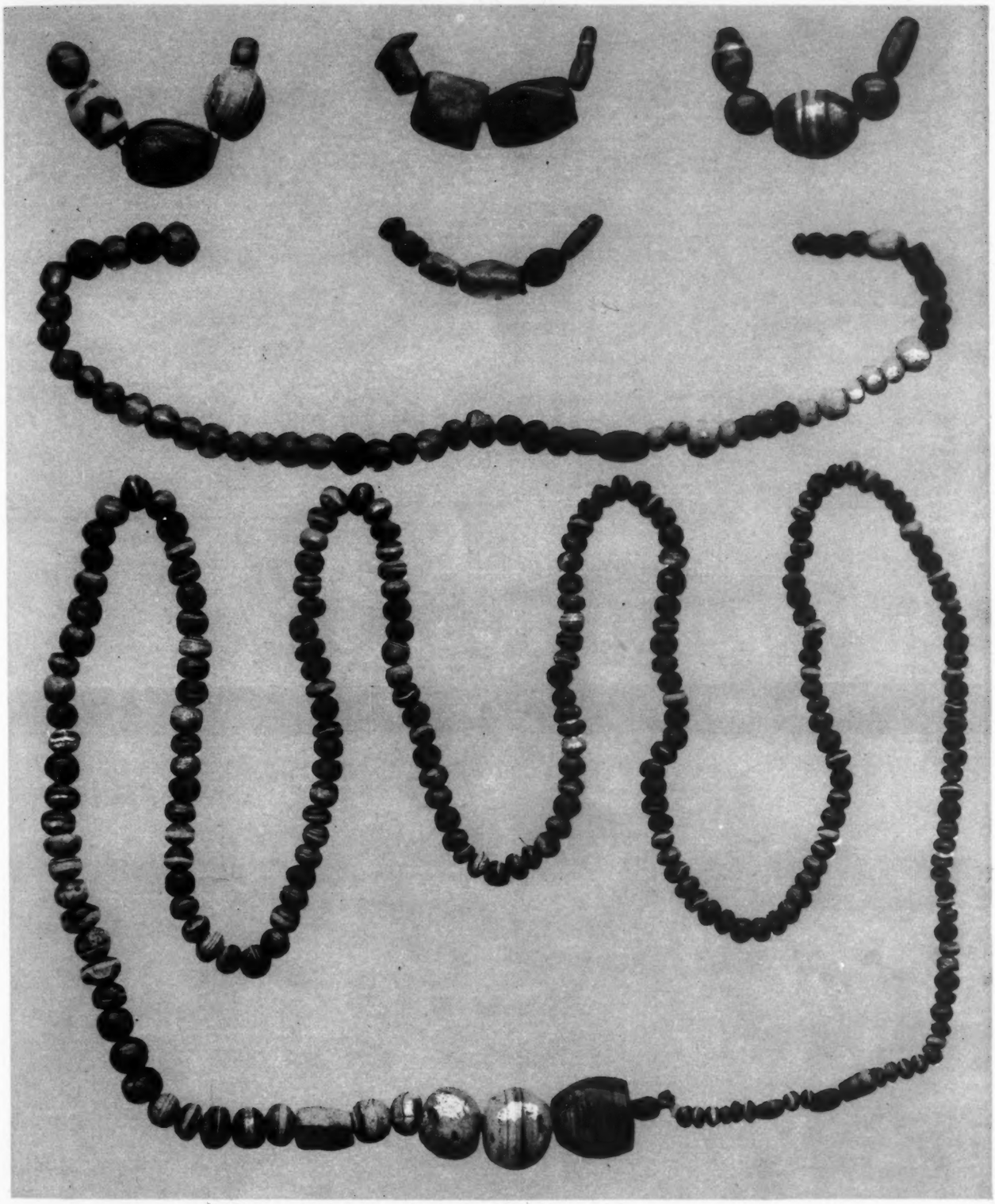
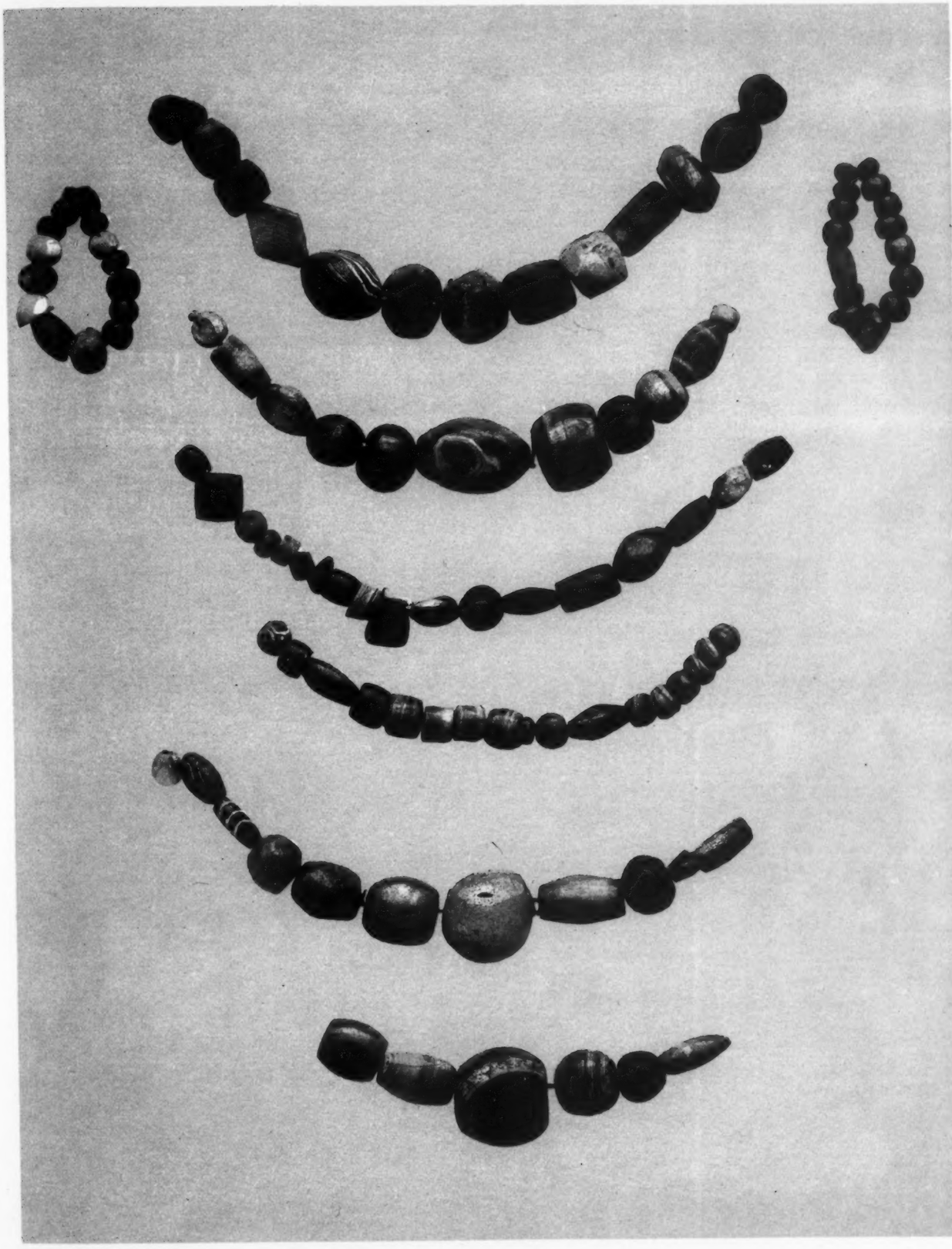


28.—FYZABAD. KWAJAHPUR, ETAH DISTRICT. SOHAN KOT, GORAKHPUR DISTRICT.



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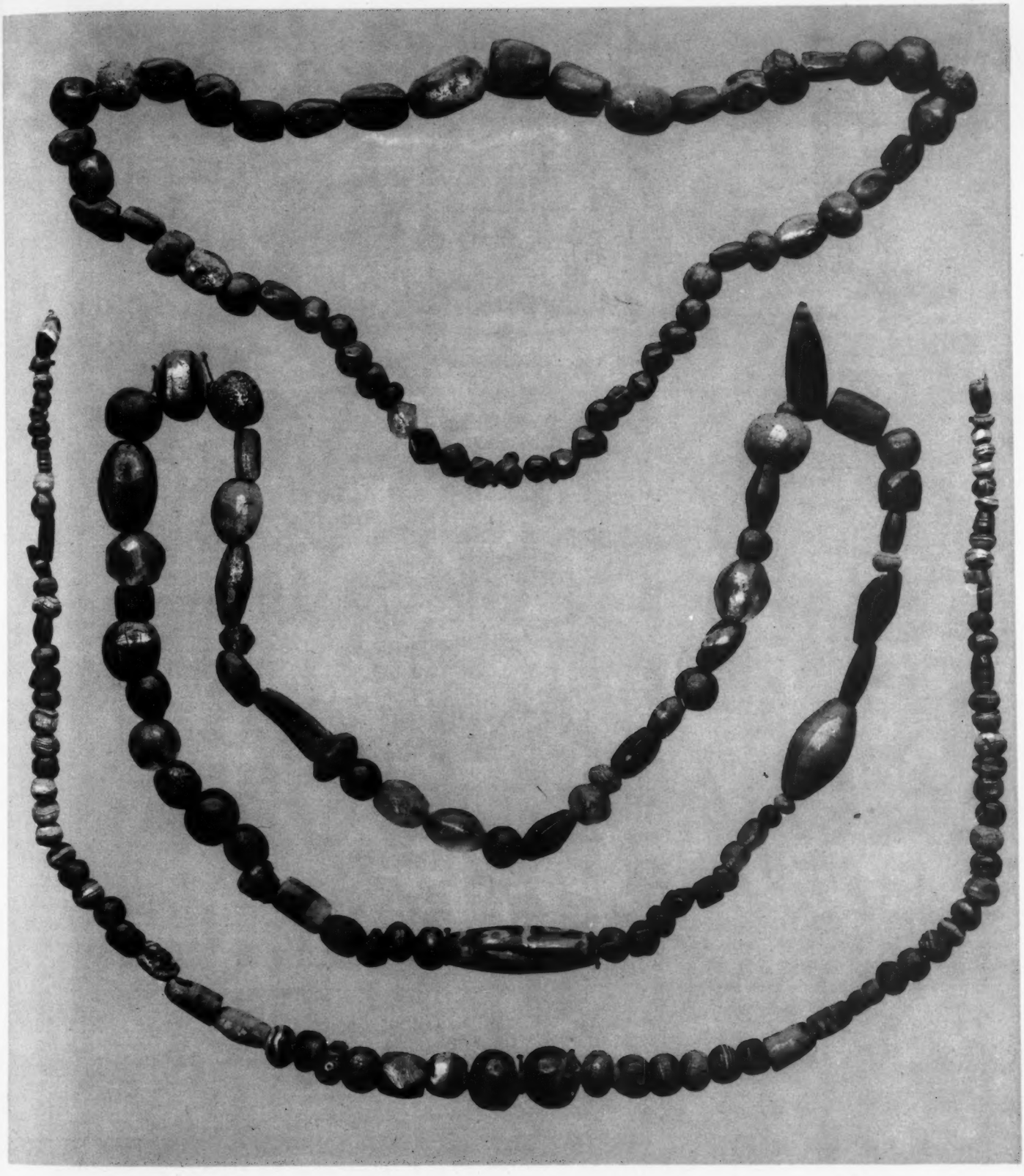

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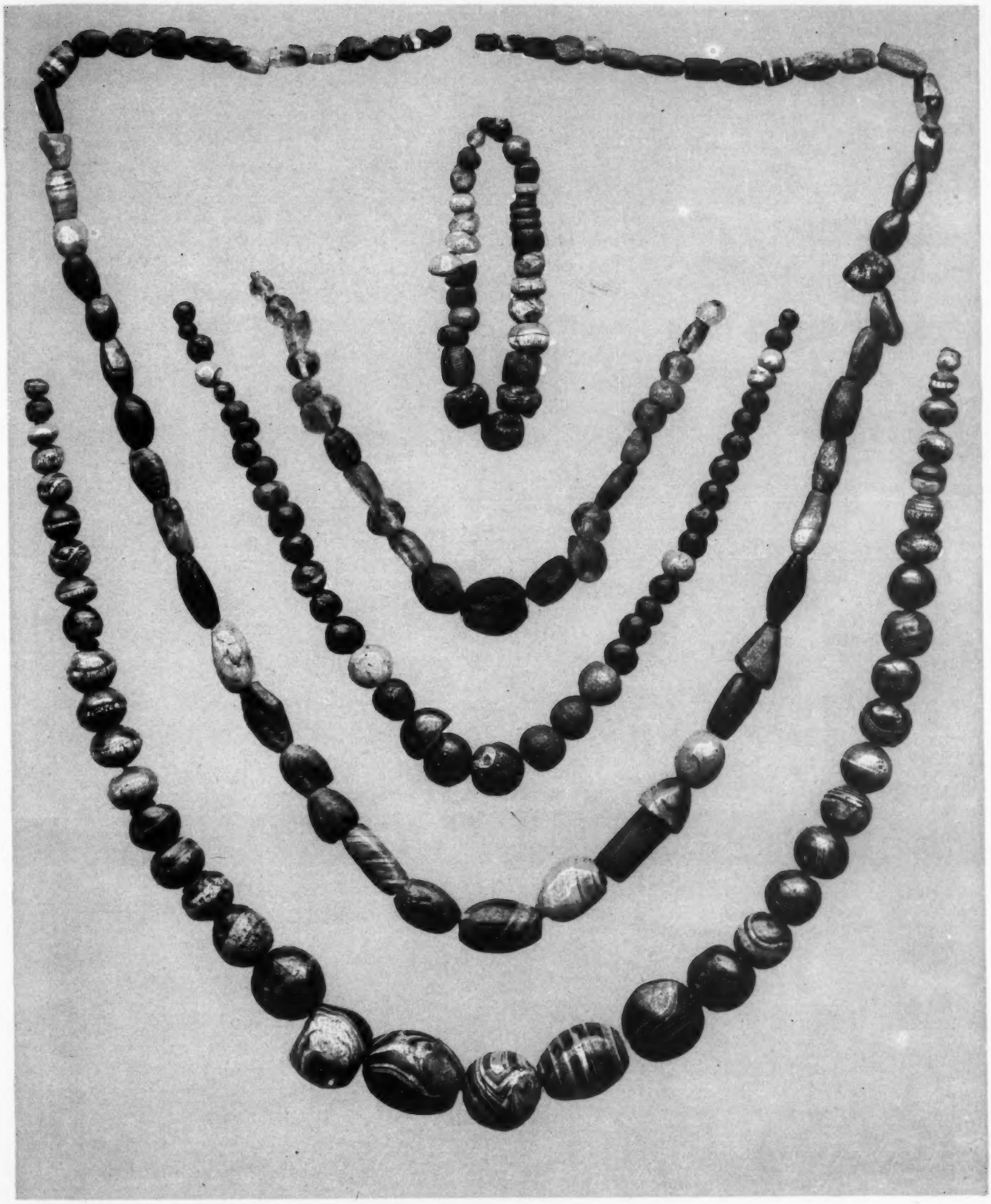

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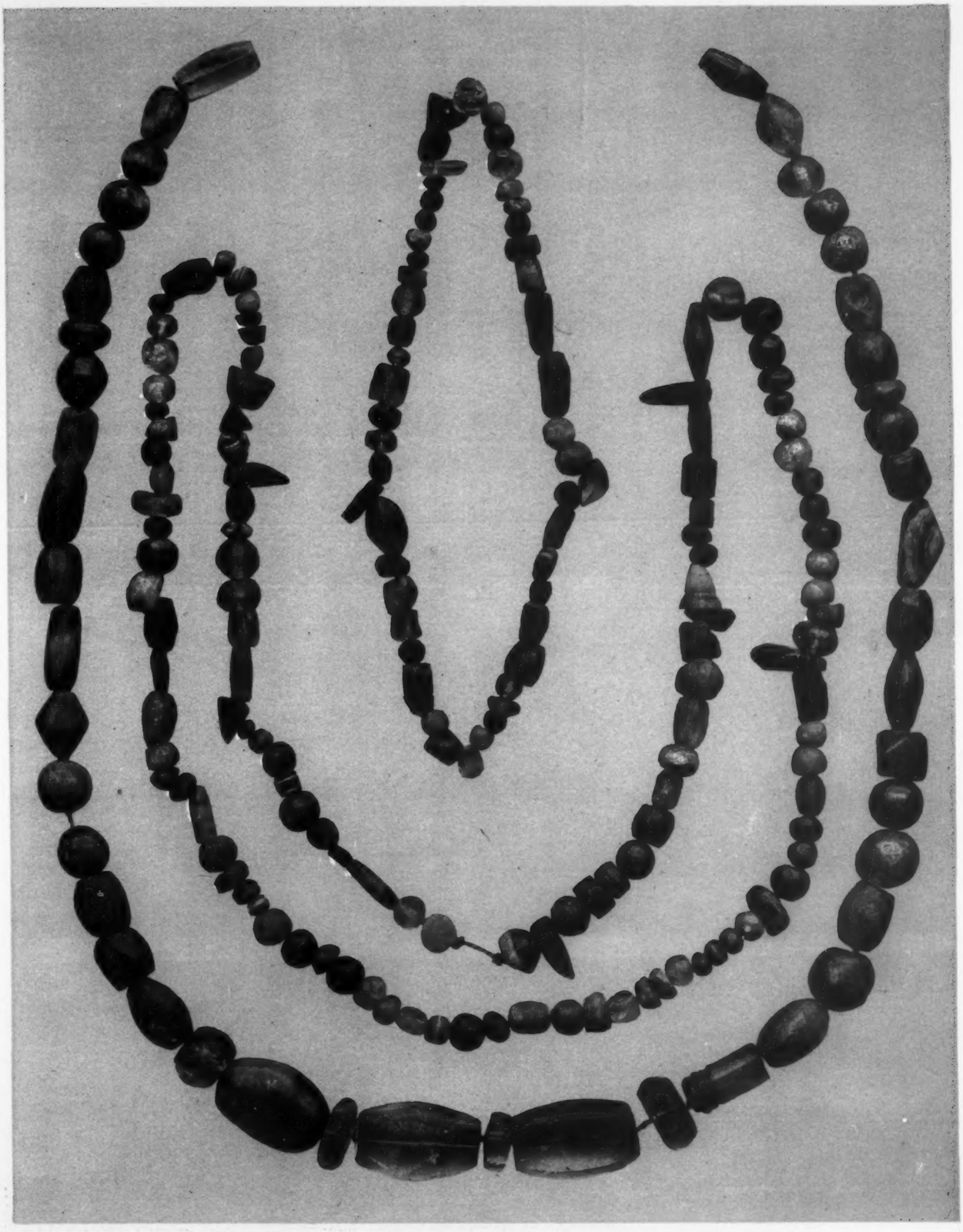

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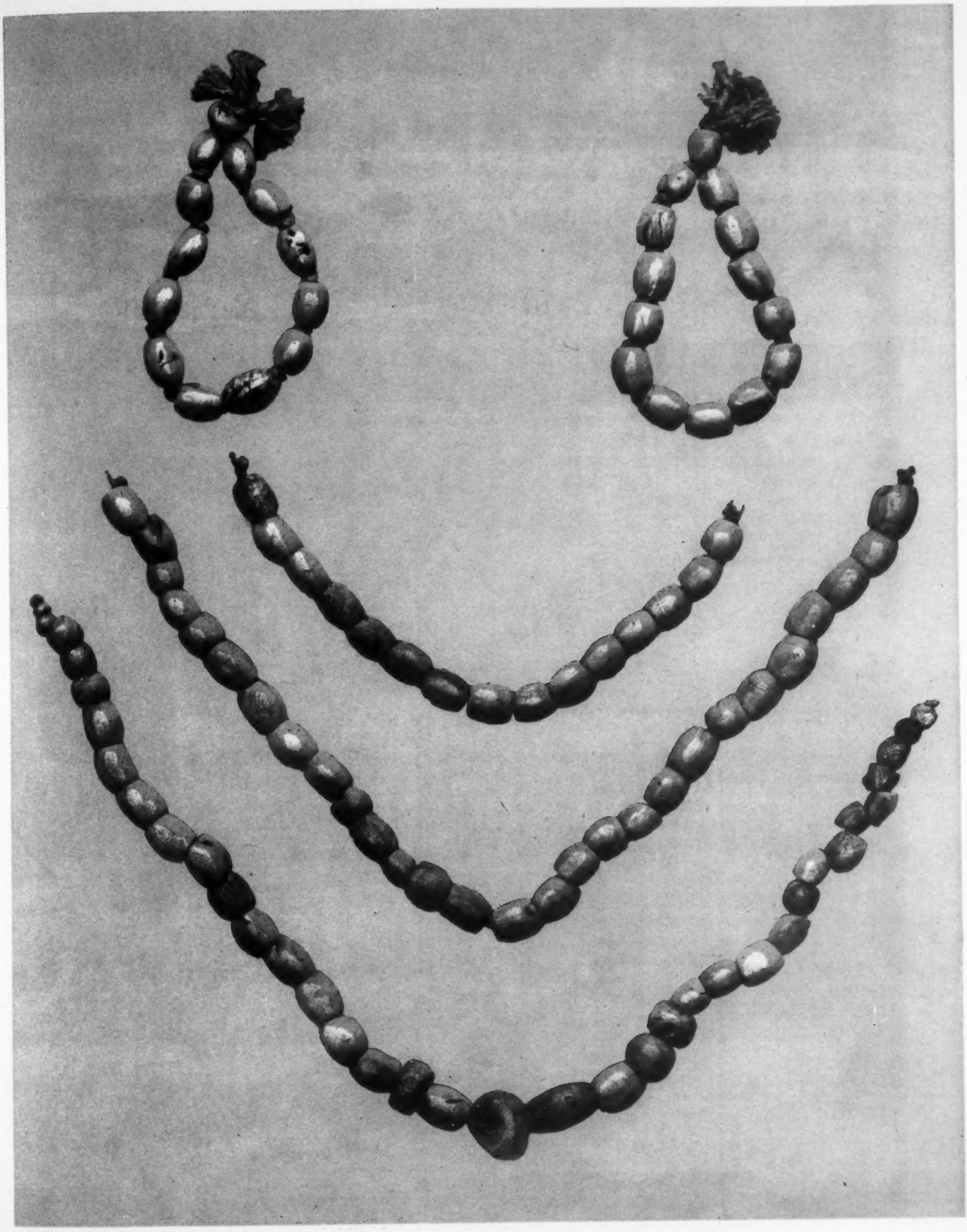

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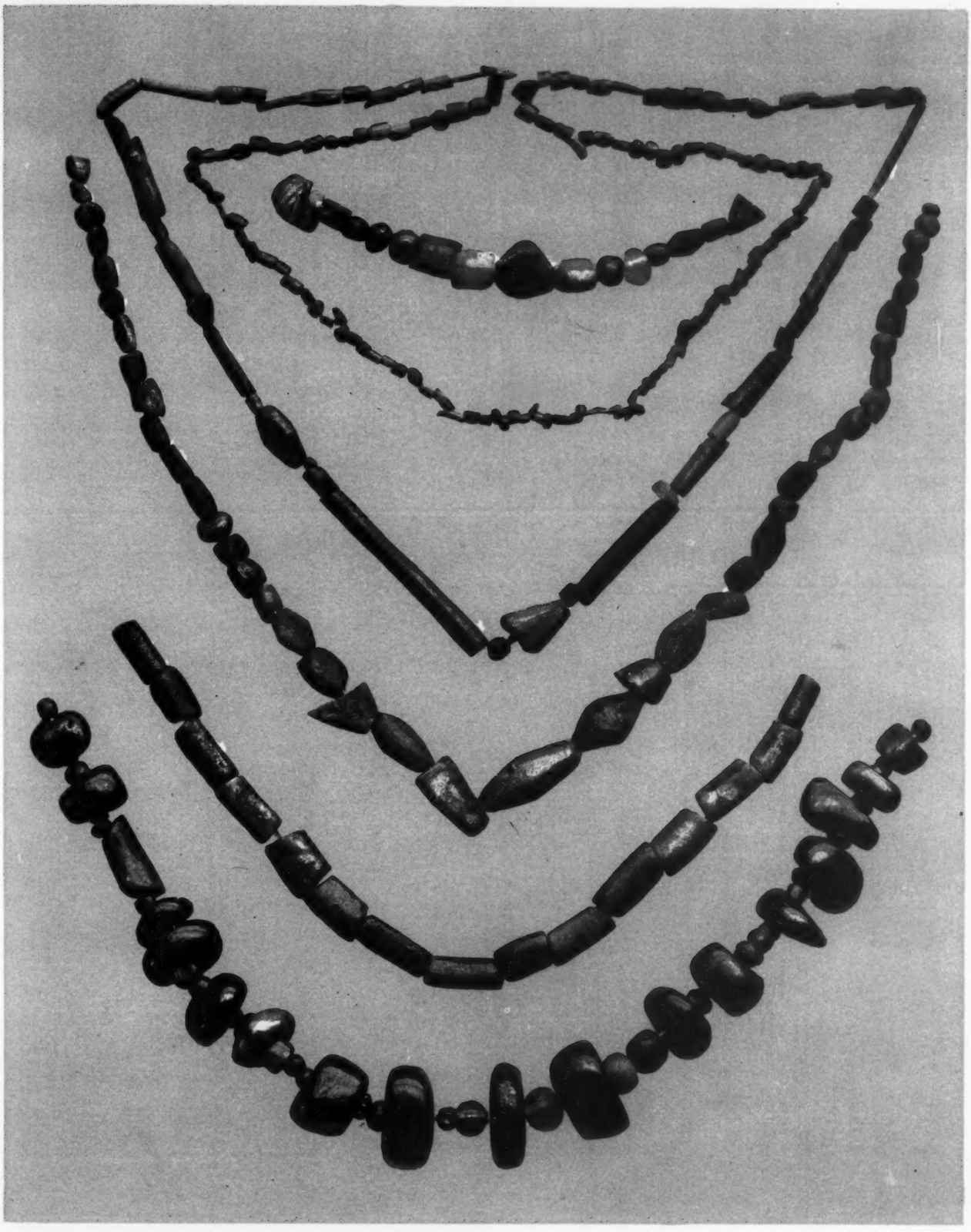

34.—KUMAON. EGYPT. KHUKHUNDU. SOHAN KOT. GORAKHPUR. 1891.

35.—GILGIT. 1891.

The Journal of Indian Art and Industry.

A LESSER HINDU PANTHEON.

BEING AN ILLUSTRATED CATALOGUE OF METAL OBJECTS USED IN HINDU RITUAL.

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Seeing that the subject has been treated exhaustively by Major Moore,[1] so far back as 1810, in his learned but rare work, enriched with many pages of copper-plate engravings, whilst Sir George Birdwood has dealt with the same in later years, in a much more accessible and practical form, in his illustrated *Industrial Arts of India*,[2] it may be thought that but little space remains on which to exhibit anything that is not already well known to Indian readers. Still, as the Hindu Pantheon claims to include some 330,000,000 deities, great and small, the subject is a large one, and some excuse is available for venturing to present a portion of a collection of objects made during many years residence in the North-Western Provinces, in the neighbourhood of the head-quarters of this ancient though somewhat complicated faith. To the many, these curious and often grotesque figures of the polluted faith, which is supposed to underlie them, are as an abomination, and I have often parted with well-meaning and intelligent visitors to the collection with the knowledge that they have left deploring the fact that any portion of my time in India should have been wasted in attention to what they have considered an unbecoming and questionable interest. Others will, however, recognise that if one has to live among a people possessing many and undeniably good qualities, it is a duty to try and learn something of their ideas and interests, and to endeavour to turn that knowledge to good account in the daily dealings with those around one. Indian history, certainly that of the early periods, is difficult to master and remember, and I made little progress until I commenced a collection of Indian coins, which was attended with remarkable success. One soon became interested in the "finds" and their arrangement, and in reading up all that related to perhaps a curious-looking coin that had a special place in a particular tray. The figure and the legend, and the history of the king who coined it, became impressed upon one's memory, and the coin remained as the land-mark of a particular period. By degrees, the vacant spaces in the trays were filled up during tours through the districts, and by red-lettered days of successful "finds" whilst groping amid the rubbish that was brought to one at each camping-ground, as the "Sahib's" seemingly queer interests became known; and at length some knowledge of the intricacies of Indian history was acquired, which would have been difficult of attainment by any other process.

The application of this method to the mysteries of the Hindu Pantheon suggested itself one day when a small copper figure of Krishna was turned over amid a cloth-full of ancient copper coins. The figure was remembered, his name and something about his legend acquired. And so the collection began and was turned to account and continued during many years, bringing with it some of the delights of which all sportsmen know in a good bag, and success in securing a specially good head, or meritorious skin. If any of the younger generation will take advice, I would say to those who go out to India, collect everything connected with not only the traditions but also the daily life of the people, and study it. Nothing helps more to an understanding of them and their ways than an acquaintance with what they use, and with what interests them. The study of an Indian bazaar[3] is, in most of its details, remunerative, even in its cheap European imports, as shewing the changes in the wants and handicrafts of the villagers brought about by foreign intercourse, whilst all that they make and use habitually exhibits their daily life. It is true that most Europeans in India are wanderers and nearly all are but sojourners, and that the necessities of light camp outfit militate against collecting anything, even the much depreciated rupee, whilst books and curios, and bulky articles are always a difficulty among the constant changes of an Indian life. Still the interest awakened will remain when the collection has gone to the local auctioneer, and judicious weeding-out will admit of a few favourite specimens being retained, which will be pleasant reminiscences when retirement from the service carries one's thoughts and interests into other, and more thoroughly explored channels.

Any merit which may be claimed for the figures of deities, and to the sacrificial and other implements grouped and photographed in this collection, will probably attach as much to their artistic as to their mythological

[1] Moore's *Hindu Pantheon*. J. Johnson, London, 1810. [2] Sir George Birdwood, K.C.I.E., &c. *The Industrial Arts of India*, 1880.
[3] Mrs. Rivett-Carnac's "*Ramble in an Indian Bazaar*," Journal of Indian Art, Vol. I.

value. On this subject, I would advance, that even the most scrupulous need take little alarm at the hideousness of the idolatry which these specimens may be supposed to suggest. Having lived for many years in a district of India within easy reach of Benares, the head-quarters of Hinduism, and having been in daily intercourse with the people of the country, I state unhesitatingly my belief that the average Hindu is as ignorant as his European fellow-subjects of the objectionable details with which some of the emblems are associated. The Brahmin priests know all of that and much more, but keep most of their knowledge to themselves, save when it is worth their while to reveal the mysteries and explain the intricacies of which they are the keepers. The ordinary Hindu knows but little of, and troubles himself still less, regarding the thirty-three millions of gods which his religion claims as its own. He may be in awe of all the gods, may regard Ganesh, the elephant god, with vague veneration, delight in the festival of Rama, and show some interest in the tricks and playfulness of Krishna, of which he has heard much as a child. But he accepts the wonderful doings of these last much in the way that some of our countrymen accept and cherish the traditions of our own popular heroes. And if he selects some special favourite from the Pantheon for family use, it is done much after the manner of those who trust to some special Saint as near to their own humanity, hoping that he may understand their weaknesses, and may help them and intercede for them with the One who seems to be far too far beyond them to admit of any direct appeal. The rough stone dabbed with red paint, or the battered figure rescued from some ancient mound, set up under the big tree outside the village, receive daily offerings of flowers or rice from the villagers as they pass out at dawn to their work in the fields. And as one sees the passers-by tarry reverently for a few moments with their simple offerings, one feels that the short prayer to the unknown God, for a blessing on the day's work, is none the less sincere, and hardly less worthy of acceptance than the prayers offered by those to whom a special revelation has given greater opportunities, imposing much heavier responsibilities. Those who have lived much among the people of India in camp, as Settlement Officers and District Officials, cannot fail to carry back with them a high appreciation of the Hindu character as that of a simple, kindly, patient race; tender and considerate in their family life, and possessing many qualities of which Christians might well be proud, and imbibing but little of the impurity with which their faith is supposed to be so deeply tainted. I am confident that if an exhibition of my collection had been held for the benefit of my native neighbours of the peasantry, although they might have recognised Ganesh with his elephant's head, and Krishna with the butter-pat, the bulk of the show would have been to them as great a mystery as it would be to any British audience. And although my Indian friends would have said that it was indeed wonderful (for had not the Sahib himself collected it?) they would have been as unable to recognise the figures as I was myself without the advantage of Major Moore's plates and Sir George Birdwood's lucid explanations. In the Opium Department in the North-Western Provinces and Oudh, in which for nearly twenty years I served, a very large number of Hindu officials were employed, many of them men of high standing and great intelligence. Several of these on numerous occasions saw and examined my collection. The commoner specimens they recognised without difficulty; as to the others, they could give me but little information, and that this was from no want of good-will was quite evident. In fact, they knew as little about them as I myself. The intricate details were all for the priests, just as the intricacies of law are for the barristers, to whom resort would be had, when necessary, to expound or apply them. Nearly every specimen in the collection was purchased at Benares, or in big cities, or places of pilgrimage where Brahmins abound. In the country-side, these gods were never to be met with. Some might, perhaps, have been found in the houses of the richer merchants. But the people, as a body, knew them not.

So far, then, as it assisted to a knowledge of the daily interests of the peasantry, the collection was, it may be said, scarcely remunerative. Still it did help to teach one many of their traditions, and explain some of their festivals. It illustrated many of the ancient Hindu writings, and increased one's interest in visits to the temples, and in the quaint and elaborate sculpture which the making of railways and canals continually unearthed. It also gave one some idea of what the richer classes and the priestly caste professed, whilst it reduced the ignorance relating to one's native surroundings in which one is only too liable to remain amid the daily telegrams, the shoals of periodical literature, and the ever-sustained European interests which affect one's life in the India of to-day.

The personages of the Pantheon have now to be passed in review, and in marshalling the figures I have availed myself of the arrangement adopted by my friend Sir George Birdwood in his valuable work already noticed. As it provides by far the most clear and readable explanation of this complicated subject that I have yet been able to find, the work has been laid under heavy contribution. Moore's plates and letterpress have also been of great assistance in recognising the figures and in describing some of their attributes.

In some cases there has been no little difficulty in assigning to a figure its proper place in the procession; and there may well be difference of opinion regarding the identity of others described. For, as Moore found, not-

standing all the advantages of ample leisure, and the few competing interests of his day, the mixed and complicated nature of many of the details and treatment of some of the members of the Pantheon leave much room for doubt. Moreover, it must be understood that the present paper purports to be little more than a catalogue of the collection, illustrated by Mr. Griggs' beautiful photographs, and does not aspire to be a treatise on Hindu mythology, fully provided in the valuable publications already cited. The Vedic gods are not included in the collection, which is confined to the

PURANIC GODS.

BRAHMA.—Of the triad—Brahma, Vishnu, Siva—although the two latter will be found fully represented, together with their consorts and *vahans* or "vehicles," no image of Brahma, the first person of the *tri-murti* or triad, has been secured by me. According to some authorities, no image of Brahma is made. This is contested by Moore, who holds that the view, though correct as regards Brahm, is not so in the case of Brahma, of whom, he states, many representations are to be found in Asia and Europe. Of these, however, he appears to have been able to figure one specimen only from the Museum of the old East India House. Sir George Birdwood in his work mentions that "Although the name of Brahma is the most familiar of all the gods of the Hindu mythology to Europeans, his worship in India is almost extinct, if indeed it was ever very popular. There are few, if any, temples dedicated to him." This would help to account for the absence from the collection of this important personage of the Pantheon. Nor is Saraswati, the consort of Brahma, represented, and images of these two, if they exist at all, are probably very rare for the reasons above noticed.

VISHNU.—Following Sir George Birdwood's arrangement, Vishnu takes first place. Of this deity the collection contains seven figures. In three cases he is represented alone, in the remaining four he appears in the company of Lakhsmi, his *sakti* or consort. He will also be seen in some of his incarnations.

"VISHNU, or HARI," says Birdwood, "is in himself and his several incarnations, the most popular of all the Hindu deities, not excepting Siva, and receives unbounded adoration all over India. . . . Vishnu is the second person in the *tri-murti* or triple form, and personifies the preserving power of Nature. . . . He is represented as a dark-blue or black man, with four arms, his two right arms holding the *gadha* or mace, called *Kaumodaki*, and a *padma*, or lotus-flower; and his two left the terrible *chakra*, or discus, named *Vajranabha*, and the *sankha*, or chank-shell, named *Panchajanya*. Sometimes he holds only the shell and the discus, or thunderbolt, while with his second left hand he forbids fear, and with his second right hand bestows blessings. He has a bow called *Sarnga*, and a sword *Nandaka*. He has on his breast a peculiar curl called *Sri-vatsa*, and the jewel *Kaustubha*, and on his wrist the jewel *Syamantaka*."

The above description will help to explain generally the several images of the god in the collection, special points in the treatment being separately noticed.

1. In the large copper figure, 12 inches high (Plate 36), the deity is represented standing, with a shrine at the back (omitted in the photograph), in the form rendered familiar by Moore's engraving, reproduced in several text-books. This god personifies the preserving power, and claims a larger following than any other member of the Pantheon. Vishnu is here represented four-armed, holding the *chank* or shell in the right rear-arm, the *chakra* or discus in the left. Of the two front arms, the right hand is extended, the left placed downwards, as an invitation, Moore explains, in the one case to ask, in the other to grant or to protect. This arrangement of the hands is noticed as it will be found frequently reproduced in many of the models. The figure is rounded and well-developed, suggesting at first sight that of a woman. But, in India, rotundity in a man is regarded as a sign of well-being and good position, and is much encouraged among the better classes, so that to be so portrayed is no bad compliment. The god appears draped, and crowned and ornamented with necklace, earrings, bracelets, and other jewels. The shrine-back is surmounted by the serpent, the significance of which will be noticed under a later heading, in describing the shrine-backs, in nearly all of which the serpent will be found to be introduced in connection with the tree. Like most of the specimens, the figure has been cast from a carefully prepared model, and then finished with the graver.

2. VISHNU (Plate 36). Brass, $5\frac{1}{2}$ inches high. This smaller seated figure of Vishnu exhibits much more delicate treatment than the larger and more popular representation of the god above noticed. The head and body evince artistic design and touch, whilst the hands have been carefully modelled, and the limbs have none of the clumsiness or want of proportion noticeable in many Hindu figures. The right hand is extended and displayed with what appears to be the lotus in the centre of the palm. Here the god is two-armed, and appears coronetted and bejewelled, as in the first specimen.

3. VISHNU (Plate 36). Brass, 6 inches high. A standing, two-armed figure; draped, bejewelled, of somewhat the same type as the preceding, but inferior in execution. The lotus to the left; right hand extended, with mark in the centre of the palm, as above noticed.

The above, so far as I have been able to discern, are the only figures in which Vishnu is represented singly in this collection, though, as will be seen, the deity appears again frequently in company with his consort, and in incarnations, or with others of his following.

LAKSHMI, known also as Sri, is Vishnu's consort, described by Birdwood as "the goddess of good luck and plenty, . . . the ideal woman, the Hindu Venus, the mother of Kama-Deva, the god of love." When Vishnu appears as Krishna or Rama, Lakshmi is then Radha, Krishna's mistress, or Sita, Rama's wife. "She is held in high honour by Hindu women, who pay her particular worship on the third day of the light half of the moon, called *Rambha-tritya*, as an act auspicious to female beauty. She is worshipped by filling the corn-measure with wheat or other grain, and thereon placing flowers. She is represented as a lovely and benign woman, robed in yellow, holding a lotus in her hand, and seated either on a lotus, or beside Vishnu. Sometimes she has four arms, and holds in one of her right hands a rosary, and the *pasa*, or cord, in one of the left. This cord is seen also in the hands of Varuna and Siva, and is emblematic of the sea, which girdles the earth."

4. LAKSHMI. Brass, 2½ inches high. A small, well modelled, and carefully treated figure, of the same type as Vishnu No. 2 in the collection. The goddess is represented seated, the right hand uplifted, as encouraging suppliants, the left holding the lotus.

5. VISHNU and LAKSHMI. Brass, 4½ inches high. Here the pair are together. Both figures are draped, coronetted and bejewelled, and the whole treatment is delicate and artistic, the hair and other details being again well finished and carefully modelled. Vishnu is four-armed, with discus, lotus, club and shell. Lakshmi to the left, with right hand down, the left uplifted.

6. VISHNU and LAKSHMI. Copper, 4 inches high. Here again the treatment, as in the preceding group, is artistic and meritorious as compared with the ordinary images and representations of Hindu deities. The details are all well worked out, even to the modelling and engraving at the back and base of the figures. The pair are represented standing, elaborately draped and ornamented. Vishnu is four-armed, with discus and lotus in the right hands, the shell and discus in the left. Lakshmi stands on the *Kurma* or tortoise, one of Vishnu's incarnations, which has a place second only to the snake in all mythology. The snake will come under notice again later in this collection. To Vishnu's left is a small figure of Garuda, the mythical eagle or vulture, the *vahan* or vehicle of the deity, described more in detail in his later place in the catalogue. Garuda is represented with his hands in an attitude of adoration or supplication.

7. VISHNU and LAKSHMI. Brass, 5 inches high. This is a much worn and evidently very ancient representation of the same pair. The image, as in the case of many others, has been frequently and copiously anointed and besmeared during a long series of years, with the results shewn. The standing figures are draped and ornamented. Vishnu, four-armed, carries, as before, the shell, club, discus and lotus. Lakshmi in her right hand has a ball, and the lotus in the left. Garuda kneels facing them, with his hands in adoration.

8. LAKSHMI. Brass, 3½ inches high. Draped and coronetted, seated on a tiger, Lakshmi is here represented suckling a child. She is probably here in her character as presiding over marriage, and as the deity invoked for the increase of children—especially male children. An attendant is on either side, that on the left waving a *chauri*, or whisp (a symbol of royalty), to keep away flies.

9 to 13. LAKSHMI. A series of figures of various sorts and sizes of this popular deity, draped and holding the lotus, and calling for no special notice.

14. VISHNU and LAKSHMI, &c. 5 inches high. This rather remarkable group, one of the best in the collection, is unlike any figured in the published plates, and is thus not easily identified. To the right and left, a male figure; a female in the centre, with four attendant figures, two waving *chauris*; to the right, a small figure in adoration. Both male figures are four-armed; the female figure has two arms only. All are draped, coronetted and bedecked. The right-hand figure is surmounted by a seven-headed snake. The female "demonstrates" the right hand, on which is the lotus. On the base is the remains of an inscription, probably the artist's or donor's name. The group exhibits creditable workmanship and a satisfactory finish of details.

15. BALLAJI (an incarnation of Vishnu) with his wives. Copper, 3½ inches high. The figure is seated and draped, with a wife on each knee. He is represented four-armed, with the lotus, &c. Each wife holds a lotus in her outer hand.

15A and 15B. Two small brass figures. Lakshmi—or perhaps wives of Ballaji?

SIVA.—The next series of figures represent, in several different forms, Siva, or Mahadeva, the third (sometimes ranked as the second) person of the *tri-murti*. "He personifies," says Birdwood, "the destructive force of nature, or rather its transforming and reproductive power, and thus with his *sakti*, or consort, Parvati or Devi,

appears under both auspicious and terrible aspects. He is confounded both with Brahma and Vishnu, and indeed in any lengthy description of one Hindu deity it is almost impossible to avoid mixing up its character and attributes with those of another." This will go far to explain the difficulty in recognising and sorting the figures, and assigning to them their proper places in the catalogue, owing to the mixed character of some of the emblems with which they are so often invested. In India, Siva and his consort claim more votaries than any other deity, their best-known symbols being the *linga* and *yoni*, representing the male and female principle in nature, reproduction, life out of death, which may not unnaturally be regarded and venerated as the greatest of all the mysteries of nature. The snake, or cobra, will generally be found with these.

16. SIVA (Plate 37). Brass, 4 inches high. Siva is here represented standing, four-armed, coronetted and bedecked, holding the *pasha* (or cord of punishment) and the sword. The figure is grotesque and, being rare, is placed first on the list of the deity. The begging-bowl, carried at the present day by so many Hindu fakirs, votaries of the god, will be noticed in the left hand.

17. SIVA (Plate 37). Brass, 3 inches high. Standing; a very old grotesque image, holding the trident in the right hand, and the begging-bowl again in the left.

18. SIVA (Plate 37). A small copper figure, two inches high, seated and draped; the snake to the right, *linga* or *mahadeo* to the left, all shewing careful modelling.

In the following examples Siva will be seen with his *sakti* or consort, and then the goddess will appear alone in some form rendered familiar by Moore's plates, and the many published reproductions of this popular deity. She has many names and attributes. Of the former the best known are Parvati, Durga, Devi, Kali, and Purna. The following extract from Birdwood's work will help to explain the images of the goddess in the various forms in which she appears on the list:—

"As Parvati she is represented as a fair and saintly woman engaged in the worship of the *linga*, or seated by the side of Siva, to whom she offers *amrita* from a golden bowl. As Anapurna (the food-giver) she sits on a water-lily, holding a dish of rice in one hand and a spoon in the other. . . . As the destroyer of Mahishasura (or as Durga, active virtue overcoming vice) she is seated on, or attended by, a lion. . . In the image worshipped as Kali she is generally represented as a black woman with four arms, having in one of her hands a scimitar, and in another the head of the giant, which she holds by the hair; a third hand is held down, inviting approach; and the fourth is held up, bestowing blessing. In some of her images as Bhavani and Durga, she wears two dead bodies for earrings, and a necklace of skulls." In her different forms, and in her aspects of benignity and terror, she covers much ground, and has been likened to several of the most prominent personages of mythology, sometimes to Venus, or Diana, or Ceres—as the goddess of love, presiding over generation; and as the goddess of plenty, as some of the figures in the collection will help to explain.

19. SIVA and PARVATI (Plate 37). A very curious grotesque old group in brass, 5½ inches high. Siva, with his consort, is seated in front of a shrine-back on which the cobra is intertwined. Siva holds the trident in his right hand, the left being extended towards his consort, who, holding Siva with her right hand, has the bowl with *amrita* in the left. In front of the pair are the bull and the *linga*, with the snake and rat, to the right; to the left, Ganesh, Siva's son, and again the *linga* with the *yoni*. Here the goddess appears in her benignant form.

20. SIVA and PARVATI (Plate 37). A group resembling the preceding, but rather smaller, 4½ inches high. The figures are draped and ornamented. The snake, *linga*, and bull emblems are also represented.

21. SIVA (Plate 37). Brass, 4½ inches high. The figure is seated, draped and bedecked; a snake is intertwined in the coronet. There is a large nimbus behind the head formed of small snakes, and a snake in the right hand. The deity is perhaps here represented as the lord of snakes, the snake being closely connected with the *linga*.

22. DURGA (Plate 37). Brass, 6½ inches high. A somewhat similar seated figure of Siva's consort as Durga, surmounted by a seven-headed snake, and holding a snake in the left hand. Here she is represented in her ferocious or cruel character, as the wife of the destroyer.

23. DURGA (Plate 37). This figure, which stands 10½ inches high, is remarkable for the excellence of the several elaborate details, and bears traces of having been gilt. The deity is eight-armed, and is here represented as active virtue destroying Mahishasura, or vice, a very popular form of representation which will be found in several of Moore's plates. She carries in her many hands the discus, arrow, trident, shell, hatchet, and serpent, and holds the demon, whom she is in the act of spearing, by the hair of the head. Her right foot is on the attendant lion, the left on the demon, who is elaborately clothed and bejewelled. The figure of the deity is specially well modelled. The hair is elaborately arranged, and the jewels, earrings, torc, rings, bracelets, armlets, and anklets are all carefully finished.

24. DURGA (Plate 37). This is a smaller figure, 5 inches high, of this popular representation of the deity

appearing again as active virtue destroying vice. She is seated, as described above, on a lion; is eight-armed; and besides other emblems, carries the bowl already noticed.

25. DURGA (Plate 37). The popularity of the deity in this character is shewn by these many images, the most numerous of any one class in the collection, in her above character as overcoming vice in the shape of Mahishasura. The copper figure, 4 inches high, is eight-armed, the hands (beautifully modelled) holding the bowl, snake, discus, &c. The right foot is again on the attendant lion, the left on the vanquished demon, who is coronetted and bejewelled, and armed with a sword.

26. DURGA (Plate 37). Another good specimen, 4 inches high, of the same subject, with a shrine at the back. The deity is four-armed, with the usual weapons, and holds Mahishasura, who has appeared in the shape of a buffalo, by the hair of the head. The head of the animal has been cut off, and the demon is issuing from the decapitated body.

27. DURGA (Plate 37). Yet another smaller rendering of the same subject, cast in brass, $2\frac{3}{4}$ inches high. The four-armed figure is standing. With the right she lifts a sword behind her head, and with another the monster is being pierced by the trident. The lion, as usual, is in attendance.

28 to 32. DURGA (Plate 37). Reproductions, all of merit, in different forms of the same popular subject. No. 30, though old and much worn, has been beautifully modelled.

33. DURGA (Plate 37). This small, seated, draped figure, $2\frac{3}{4}$ inches high, with trident, is probably Durga.

34. DURGA (Plate 37). Four-armed, seated on a lion, with sword and bowl. She wears a triple necklace and large earrings. The hair is carefully plaited in a pig-tail at the back.

35. BHAVANI (Plate 37). In this well-modelled specimen of the deity as Bhavani will be seen the necklace of skulls referred to above in the extract from Birdwood's description of the deity. The right and left feet are placed on prostrate figures. A female figure kneels to the right in an attitude of adoration.

36, 37. DURGA (Plate 37). Two more small figures of Durga. In the latter she is seated on the lion.

38. DEVI (Plate 37). This figure would seem to be Siva's consort as Devi. The shrine-back is curious. The deity is seated on a tiger, and attended by four figures with *chauris*, or fly-whisks. On either side is an elephant.

39. DEVI (Plate 37). Seated cross-legged on an elephant, the figure is four-armed; two elephants are at the back.

40. DEVI (Plate 37). A small brass cast, 4 inches high. The figure is seated on a pedestal, and is four-armed, one being uplifted. Two elephants act as "supporters."

41. MAHADEO and PARVATI (Plate 37). The goddess is seated on the left knee of her husband, who holds an axe in his right hand. The group is surmounted by five snakes.

42. DURGA (Plate 37). A small figure seated on a lion, similar in some respects to those previously noticed.

43. KANDA-RAO and MALSARA (Plate 37). Siva and Parvati on their way to destroy the giant Mani-ucal. They are represented riding together on a horse, the wife holding on to her husband. They are clothed and bejewelled, and each armed with a sword. The image has been recognised by the help of Moore's plate and description.

44 to 54. ANAPURNA (Plate 38). A large collection of images of Siva's consort as *Ana* (grain) *purna* (abundance), meaning—the goddess who supplies the food. She is, says Moore, a very common household deity, and has been likened to Ceres. She is generally represented with a bowl of grain in one hand and a ladle in the other.

55. GANAS OF GODS (Plate 39). In the foregoing the deities have been seen singly, or with their consorts. The *Ganas* now to be noticed are collections or assemblies of certain deities, with their attendants. Of these, according to Moore, there are nine. In the first of these Ganesh, the elephant-god, the elder son of Siva and Pârvati, will be recognised. The same authority states that Ganesh generally presides at these assemblies, and is said to derive his name from *Gan-isa*—lord, or president of the assembly. The personages and symbols here are connected with Siva worship—the *linga* and *yoni*, the bull, Hanuman, and the snake.

56 to 64 are all *Ganas* representing the same subject, in all of which Ganesh, the *linga*, and the snake are prominent. They are all old, and appear to have done good service in their time, and contain many details of interest.

65. KRISHNA (Plate 40). We now come to the lesser gods, Krishna, the best known of the incarnations of Vishnu, having the first place. He would appear to be a popular hero transformed into a deity, and is a favourite figure in Hindu mythology, the legends connected with him being numerous. The most popular are

those connected with his sports among the cowherds and milkmaids at Gokula. He is represented in this figure, and in the following 66 to 69, playing the flute, of which he, like Apollo, is said to be the inventor.

70 to 77. KRISHNA (Plate 40). Krishna in these appears in another equally popular legend, as Bala Krishna, or the child Krishna, stealing the pat of butter, well known to all Hindu children as a playful incident of his boyhood. The pat, or ball, in his hand is sometimes supposed, according to Moore, to represent the earth, denoting the deity's supremacy or dominion over it. The number and variety of the figures testify to the popularity of this personage.

The female figure (78, Plate 41), evidently a companion to 66, is one of the milkmaids of the legend, probably Radha, his favourite among them.

79. RAMA (Plate 41). Another of Vishnu's incarnations is almost equally popular, that of Rama-Chundra, the hero of the Ramayana, and husband of Sita. He appears draped, and elaborately ornamented, carrying in his right hand the bow, by which, Birdwood says, he may generally be recognised.

80 to 87. HANUMAN (Plate 41). Hanuman, the monkey-god, the ally of Rama in his expedition against Ravana, demon king of Lanka or Ceylon, also enjoys a wide popularity, as the number of his images will shew. "He jumped from India to Ceylon at a bound. Surasia, a Rakshasi, mother of the Nagas (literally 'snakes' and also 'hillmen,' the Scythic worshippers of the cobra) opened her mouth to swallow him bodily, but he swelled himself out wider than ever she could stretch her mouth, till it was a hundred leagues wide from ear to ear. Then Hanuman, suddenly shrinking himself to the size of his thumb, leaped into her jaws, and out through her ear. These exploits of his are the delight of the native nurseries of all India." The above extract from Birdwood's work (page 79), to which reference is invited for detailed descriptions of this and other images, is given as indicating that, as already noticed, many of the personages of the Pantheon are, to the mass of the people, quite as much legendary heroes, as divinities.

88 to 101. GANESH (Plate 42). Ganesh, the son of Siva and Parvati, already briefly noticed under the *Ganas*, and well known as the elephant-god, the god of wisdom. "His image stands," says Birdwood, "in every house, and is painted on every Hindu schoolboy's slate, and he is invoked at the outset of every undertaking." In this image he is represented seated cross-legged, with four arms, holding the lotus, ankus, and apparently a small cake, whilst with the remaining hand he is occupied with the trunk of his elephant head. The remaining figures of this god (89 to 101) are all more or less similar in treatment. The large number obtained testifies to the popularity of the deity as noticed by Birdwood in the above extract.

102 to 110. GARUDA (Plate 43). We now come to the *Vahans*, or vehicles of the gods. Garuda, the king of the birds—half eagle, half vulture—the vehicle of Vishnu, is one of the best known, and is represented in the images numbered from 102 to 110 inclusive. A *nag*, or cobra, will be noticed under the left knee, as he is in the attitude of crushing it, in his character of *nag-anteka*, or destroyer of serpents.

111, 112. JAGGERNATH (Plate 43). These images are as interesting, and it is believed rare, as any in the collection, and represent an incarnation of Vishnu, known to many Europeans by name from the celebrated temple and car on the east coast of India at Puri, and sacred to the deity as "Lord of the Universe." It will be noticed that the groups, which are old and grotesque, each have three figures, representing the god attended by Balarâma, Krishna's favourite brother, and his sister Subadrâ.

113 to 118. SACRED BULLS (Plate 43). The *Nandi*, or bull, Siva's vehicle, finds a place in all Siva temples, and is generally found with the *linga*, sometimes taking the place of the hump on the animal's back.

119, 122. BUDDHA (Plate 43). These figures may at first sight appear out of place in a Hindu Pantheon. But his images are included by Moore, and by many is regarded as an incarnation of Vishnu, the followers of Buddha being held by Moore to be offshoots from the Vishnuvite stock. A full account of his votaries will be found at page 98 of Birdwood's work, to which reference is invited by those interested in the subject.

123 to 137. BUDDHIST LIONS, ELEPHANTS, &c. (Plate 43). A group of Buddhist lions, similar to the stone representations on temples.

138 to 141 (Plate 43). Doubtful. Images to which it has been found difficult to assign places.

142 to 150. SHRINE BACKS (Plate 44). The collection contains a considerable number of shrine backs, or screens, detached from the figures and pedestals to which they formerly belonged. Some of them are remarkable for the symbols represented, and show also signs of good workmanship. In all will be found the cobra with the tree, a subject treated of in detail in Fergusson's work, *Tree and Serpent Worship*. The coils of the snake lend themselves readily to decoration, and they will be found in uneven numbers from three to eleven, intertwined, the heads being brought out at the top to form a canopy. In No. 144 and others the serpent is seen coiled round

the tree, which in many of the specimens help to form the background. These shrine-backs have belonged to images or groups of images from which they have been separated, and the shrine back and figures are not often found together.

ARTICLES USED IN HINDU RITUAL.

The principal images having been described, some of the articles used in Hindu ritual will be noticed. Miss Gordon Cummings' work, "*From the Hebrides to the Himalayas*," is quoted by Birdwood, in which she describes how it is impossible to walk through the bazaars of Benares without recalling the descriptions of the vessels of the Temple of Jerusalem, "the cauldrons, pots and bowls; the shovels, the snuffers, and the spoons, the censers, the basons, the lamps, the candlesticks, and all manner of things, to be made either of gold, or of bright brass, which might be continually scoured. Here in the open sunlight are stalls heaped up with all sorts of brass work for the use of worshippers. Incense-burners and curious spoons, basons and lamps, pots and bowls, and a thousand other things of which we knew neither the name nor the use."

151 to 159. ARTIS or ARATIKAS, or sacrificial lamps (Plate 45). The *artis*, or sacrificial lamps waved in a circular manner before the idol, are very numerous, and often differ in form, and in ornamentation, and in the figures which accompany them, according to the deity in whose worship they are employed. Some are so arranged as to the emblems as to admit of their use, as Moore explains, in the worship of "congregated deities, adored by sects in common, or by that sect who endeavours to avoid the inconvenience of schismatic jealousies and ill-will, by joining several deities in one general system of adoration: worshipping the deities conjointly although perhaps their power and attributes are particularly and separately propitiated." This remark applies not only to the lamps, but to many of the utensils used in the ceremonies.

No. 151 is a five-wicked lamp termed a *punch-arti*, borne by a figure of what may be termed an Assyrian type, coronetted and draped. No. 152 is similar in arrangement, being supported by a female cross-legged figure. No. 153 (Plate 45) is an *arti* of a more elaborate character, presided over by Ganesh, the elephant-god, and thus indicating its use in Siva worship. The deity is seated, six-armed, coronetted, bejewelled and draped, holding the *ancers*, axe, &c. The rat (his "vehicle") and two peacocks accompany him. The specimen is probably from Nepal, and is somewhat similar to some of the beautiful specimens in the magnificent collection made by Sir Edward Durand in Nepal, and figured in a former number of this Journal.

The remaining lamps all have their special peculiarities, the snake being worked in in several of them, and generally utilised as a handle. The larger receptacle is a reservoir for the oil, from which it is ladled, as occasion requires, into the smaller basin with the wick.

The large *arti*, No. 193 (Plate 46), brass, 11½ inches high (which has been dwarfed in the photograph), deserves more special mention, and resembles that figured by Moore, in Plate 105, from the specimen in the India Museum, similar to Plate 28 in Birdwood's book. These beautiful specimens are rare, and with much difficulty, after many years of search, only two were secured by me. In this specimen the handle is formed by seven cobras elaborately intertwined, the seven heads being raised as a canopy. The principal figure would appear to be Parvati, four-armed, seated in front of a shrine, the background of which is foliated. The many accompanying figures are delicately worked, and the treatment exhibits artistic merit.

The plain lamp (No. 158) calls for notice from its shape, which follows that of the *yoni*, the lighted wick taking the place of the *linga*, and suggesting some connection with the vestal lamp.

160. BELLS (Plate 46). A great variety of bells, or *gantas*, used in temple and private worship, are represented in the collection, and are employed at intervals to attract the attention of the worshippers, and to emphasize certain proceedings or part of the ceremonies. The presiding deity, or his emblems, are generally worked into the ornamentation, or his vehicle or attendant is represented. Figures of Ganesh and Hanuman often form the handle, and the snake is frequently found curled round the base, the head forming a canopy. No. 192 (Plate 46) is a remarkably fine specimen; though dwarfed in the photograph, it is 14 inches high. It is surmounted by a winged kneeling Garuda, with his hands in an attitude of devotion, holding the lotus, and the hands resting on a cobra erect. The cobra will be seen under each arm, and again as earrings, whilst the same emblem surmounts the head of Garuda, forming a canopy.

162 to 164. SNAKES (Plate 45). The several fine specimens are connected with *linga* worship, and surround, surmount, or take the place of the *linga*, representing the same emblem. In the centre of the seven-headed snake (No. 162) a space has been left, which was probably filled by a stone or metal *linga*.

169 to 178. SACRIFICIAL SPOONS (Plate 46). The spoon, or *surwa*, is used to ladle out the Ganges or holy water used in ceremonies, and is found in a variety of forms, ornamented, like the bells, with the figures or emblems of the deities in whose worship it is used. The treatment is often graceful and artistic, and the snake, as usual, lends itself to the purpose, and is frequently employed.

Among some miscellaneous objects in Plates 44 and 45, the following may be noticed:—

168 is a horoscope, which all Hindus have drawn for them, and which are generally carefully preserved. The specimen probably came into the market on the death of some unfortunate pilgrim far away from his friends.

161, which has probably no religious significance, is a graceful stand for a bowl or platter, formed of delicately moulded buds, supported by peacocks as feet.

165 is a curious pyramidical arrangement, somewhat resembling the balls piled one on the other in Siva worship. The present specimen is used in Surya worship.

177 to 181. A variety of copper and brass bracelets and armlets, covered with miniature representations of the emblems of Siva worship. These are generally brought away by pilgrims who have made the journey to the temple of Pasparnath in Nepal, and are given in exchange for a sufficient payment by the presiding Sivite priest.

190 is a pen-case and inkstand combined, the pen-case being fixed in the girdle. The forms are good.

191 is a lamp and bell combined, which is affixed to a sweetmeat-seller's tray by the devices at the base. The specimen has been figured on account of its quaint shape.

183 and 184 are boxes for carrying *pan-supari*, the leaf and nut which the native of India habitually chews.

185 and 186 are quaintly-formed instruments for cutting the nuts, having lions or lions' heads to hold the blades.

182 and 189 are cases for holding the *henna* with which the native women pencil their eyes.

WATER VESSELS (Plate 47).

A large variety of these, in all shapes and sizes, are figured in this collection, some being noticeable for their shape and workmanship.

194. Included in this plate is really a metal beggar's-bowl, used by Sivite ascetics and beggars, formed in the shape of the gourd, with which Siva is generally represented.

Most of the vessels are carefully engraved with foliate patterns of more or less merit.

198, 199, 205, and others are ornamented with figures; in the first case those of the ten *avatars* or incarnations of Vishnu, and are of the character of that described by Mrs. Rivett-Carnac in her paper in a former number of this Journal. The larger ones are used to keep Ganges or holy water for use in a temple or house.

From these the water is transferred to the smaller vessels, the *panch-patris* (219, 220, 221), in which one of the spoons already shewn in Plate 46 are placed, and with which the water is ladled out on to the image worshipped.

203, 209, 210, and others are of brass ornamented with copper panels, and are termed *Ganga-Jamni*, or Ganges and Jamna, the metals representing the two rivers.

204 has been overlaid in parts with copper, and the squares are carefully worked, the vessel being probably of Southern Indian workmanship.

J. H. RIVETT-CARNAC.

Schloss Wildeck, Switzerland.
October, 1900.

ILLUSTRATED BY 221 EXAMPLES ON TWELVE PAGE PLATES.

36 (1-15*b*).—VISHNU AND LAKSHMI.

Colonel Rivett-Carnac's
"Lesser Hindu Pantheon."

37 (16-43).—SIVA AND CONSORTS.

Colonel Rivett-Carnac's
"Lesser Hindu Pantheon."

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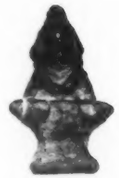

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54

38 (44-54).—ANAPURNA.

Colonel Rivett-Carnac's
"Lesser Hindu Pantheon."

39 (55-64).—GANAS OF GODS.

Colonel Rivett-Carnac's
"Lesser Hindu Pantheon."

65 67 66 68 69 70

71 71 71 71 71 71 71 77

72 72 72 73 74 75 76

40 (65-77).—KRISHNA.

Colonel Rivett-Carnac's
"Lesser Hindu Pantheon."

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41 (78-87).—HANUMAN, ETC.

Colonel Rivett-Carnac's
"Lesser Hindu Pantheon."

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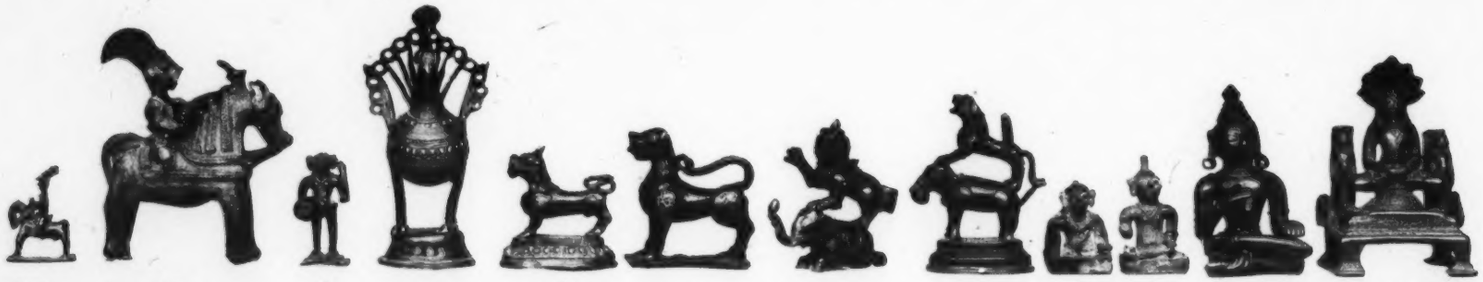
101*a*

42 (88-101*a*).—GANESH, THE ELEPHANT GOD.

Colonel Rivett-Carnac's
"Lesser Hindu Pantheon."

102 103 104 105 106 107 108 109 110 118

116 117 115 114 113 113 113 112 111 111 111



130 129 128 127 126 125 124 123 122 121 120 119

131 132 133 134 135 136 137 138 139 140 141

43 (102-141).—GARUDA, AND VARIOUS.

Colonel Rivett-Carnac's
"Lesser Hindu Pantheon."

44 (142-150).—BACKS OF SHRINES.

Colonel Rivett-Carnac's
"Lesser Hindu Pantheon."

45 (151-168).—ARTIS OR SACRIFICIAL LAMPS, BELLS, ETC.

Colonel Rivett-Carnac's "Lesser Hindu Pantheon."

46 (169-193).—SACRIFICIAL SPOONS, AND VARIOUS.

Colonel Rivett-Carnac's
"Lesser Hindu Pantheon."

47 (194-221).—VESSELS FOR HOLDING GANGES WATER, ETC.

Colonel Rivett-Carnac's
"Lesser Hindu Pantheon."

The Journal of Indian Art and Industry.

THE SALT INDUSTRY OF RAJPUTANA.

By F. ASHTON, Esq., Deputy Commissioner, Northern India Salt Revenue.

The importance of the salt industry of Rajputana will be recognised, when it is mentioned that the sources of production furnish supplies of salt to five of the great territorial areas of India. The salt of Rajputana is in general use throughout the territory of that name, and it is extensively consumed in Central India and the North Western Provinces and Oudh. To the Panjab and the Central Provinces it is exported in lesser quantities, though the trade in it is of importance in connection with those areas also. The average production of Rajputana salt is about 200,000 tons annually, and it is consumed by about 59 millions of people.

In the Administrative nomenclature of the Indian Empire, the term Rajputana signifies a great territorial circle, which includes nineteen autonomous Native States with the British district of Ajmer in the centre. This territory lies letween 23° and 30° north latitude and 69° 30′ and 78° 15′ east longitude, and the salt sources for which it is celebrated are situate in its north-western portion and north of the Aravali mountains. The character of this region is sandy, unproductive and badly watered. Between the Aravalis and the Luni (from *lún*—salt) river, a stream which takes its rise near Ajmer and follows a south-westerly course until it reaches the Runn of Kutch, the country is comparatively fertile and well watered. But to the north and north-west of the Luni, which is flooded during the monsoon only and is merely a dry water-course at other seasons of the year, the country becomes more and more sandy and unproductive, with the water level falling deeper below the surface, until it merges into the Indian Desert, a vast area covered with interminable ridges of sand varying from 50 to 100 feet in height, and with the water level, where this can be reached, from 300 to 400 feet below the surface.

The whole of this area is saline in character. As a rule, the water obtained from wells is more or less brackish; in some instances so brackish as to be undrinkable by human beings, and in such cases the scanty population have to depend upon rain water stored in small reservoirs constructed underground. When depressions below the general surface level occur, salt effloresces profusely; and where these depressions are large, brine is obtainable for the production of salt. There are a number of depressions capable of producing salt, and the principal ones from which salt is at present obtained will now be described.

The most important of these salt sources is the Sambhar Salt Lake, which is situated in latitude 26° 58′ north and longitude 75° 5′ east, and at a height of about 1200 feet above the level of the sea. The lake is about 20 miles in length, with a breadth varying from two to seven miles, and with its major axis north-west to south-east; and it is about 60 miles in circumference and covers an area of about 90 square miles. The country surrounding it is sandy and sterile, with the Indian Desert to the westward. The more north-easterly spurs of the Aravali mountains, bare and barren peaks and ridges, intervene between the lake and the desert country, and it is this intervention which has served to protect the depression of the lake from being filled up with blown desert sand.

Local tradition relates that at one time a dense forest flourished on the plain now occupied by the lake. About the year 540 A.D., a Chohan Rajput, named Manik Rai, who lived in a village called Sirthulla on the margin of the depression, used to graze his cows in this forest, and observed one day that one of the animals returned home dry. Determined to discover the reason of this, he watched the cow the next day and found that she proceeded to the cave temple of the goddess mother Sakambri (the consort of Shiva) in a conical hill on the western edge of the plain, and there milked herself into the brass vessel of an ascetic who sat motionless at the shrine absorbed in contemplation of the Deity. Having conducted herself in this pious manner, the cow returned to the herd, but Manik Rai remained behind and stole up unperceived close to the holy man. After a while, the ascetic removed a charm from his mouth, and placing it on the ground, commenced drinking the milk. Manik Rai instantly picked up the amulet, and by its virtue visited in spirit the twenty-four sacred places of Hindu pilgrimage in a moment; and as soon as the ascetic had finished his draught, presented the charm. The holy man, now observing the stranger for the first time, was surprised at his honesty in returning the priceless amulet, and desired him to keep it. Manik Rai, however, refused, on which the ascetic directed him to present himself before the goddess, who would be kind to him. Obeying the ascetic, Manik Rai reverently approached the shrine, on which the goddess, instantly creating a horse, bade him mount and ride, but warned him to abstain from looking backwards. In accordance with this injunction, Manik Rai mounted and rode, taking a somewhat circular course, and as he passed along, the forest disappeared and the plain became covered with solid silver. By evening he had proceeded about 50 miles, when the branch of a tree having caught his turban, he turned to disentangle it, forgetting for a moment the goddess's prohibition; the horse stopped instantly and refused to go further. Manik Rai had no choice but to return home. As the sun arose next morning and displayed a vast plain of glittering silver, the inhabitants of the village of Sirthulla were awe-struck, and collecting in knots, sought fearfully from each other the meaning of the strange sight. Manik Rai then related his adventure of the previous day, on which the sages of the community determined that he should be deputed to the goddess to beg her to take back her gift, as it would assuredly be the cause of war and destruction to the village. Manik Rai accordingly approached the shrine and delivered the message. The goddess replied that from real silver the plain would be transformed into one of apparent silver, and it instantly became a vast sheet of water. The inhabitants of Sirthulla remained ignorant of the value of the lake till some time after, when a native officer of position in passing the lake noticed the formation of crystals of salt in the water, communicated its worth to them, and had himself placed in charge of the place in order that he might manufacture salt. A family now residing at the lake

claim to be the descendants of this personage; and judging from this tradition, the lake has been worked for salt during the past 1400 years.

The bed of the lake is composed of a fine, black, tenacious mud, very soft to a depth of about two feet from the surface, but gradually hardening at lower levels. It shelves very gradually towards the centre, the fall in 3·27 miles being only 2·08 feet. The lake has no outlet. The supply of water which enters it is derived from three rivers which empty themselves into it; two from the spurs of the Aravali hills to the westward, and the third and largest from the country to the north. During the hot and cold seasons, these rivers are dry, with salt efflorescence covering their beds, as the country they traverse is impregnated with salt; but during the annual rains they come down in flood and fill the lake to a depth of about four feet in the centre in a season of good rainfall. With this depth, the whole of the lake is covered with water. The rainfall varies greatly; during the past twenty-three years it has fluctuated between 40 and 10 inches annually, but the average fall is about 20 inches. Evaporation in the dry sandy country in which the lake is situate is extremely rapid, and in years of ordinary rainfall the whole of the water which accumulates during the rainy season is evaporated during the succeeding dry months, leaving a crust of salt on the lake bed. Occasionally, after an exceptionally heavy rainfall, the lake contains water throughout the year. During the rainy season, the scenery of the lake is exceptionally fine; a magnificent sheet of water (its shallowness is not apparent), with bold rocky hills to the westward, and the surrounding country clothed with grass of a tender green. But during the dry months, the country resumes its sterile appearance, and the bed of the lake, with its crust of salt, takes the appearance of a plain of white glittering snow.

The density of the lake brine varies with the annual accumulation of water. In a year of ordinary rainfall, it is about 3° Beaumé (the density of sea water) at the close of the rainy season in September; occasionally, when the lake is exceptionally full, it is less; and during years of drought, when the rivers come down in slight flood only, it is as much as 10° Beaumé. The salt in the brine appears to be derived from two sources. The surrounding country, the drainage of which falls into the lake, is saline, and during the annual rains a considerable quantity of salt is washed into the lake yearly. The principal source of supply seems, however, to be subterranean. A stratum of salt brine of high density underlies the bed of the lake at a depth of about 30 feet and under considerable pressure. Except during years of very heavy rainfall, the whole of the brine in the lake evaporates, leaving its bed exposed to a very high degree of solar heat in a peculiarly dry atmosphere. But though this happens, the mud of the lake bed always remains soft and wet, even during years of most severe drought. This is probably owing to the evaporation of the subterranean brine, and the salt in that brine is in such case drawn upwards by capillary attraction and remains in the soft mud on the surface of the lake bed. When the lake again fills and the water which has accumulated in it is agitated by the strong winds which prevail during the dry months, much of the salt in the surface mud is probably taken up in solution, and the visible supply of salt is thus renewed. Experience has shown that the brine is richer in chloride of sodium in years during which high winds blow, than in those during which the atmosphere is comparatively calm.

The lake lies within the boundaries of the Native States of Jaipur and Jodhpur. The western half lies within the Jodhpur State, and the eastern half is owned by both States jointly. The population in the neighbourhood of the lake is sparse owing to the sterility of the country, but there are two not inconsiderable towns on the shores of the lake itself; Sambhar (from which the lake takes its name), at the eastern end, with a population of about 12,000 inhabitants; and Nawa, on its north-western shore, with about 5,000 inhabitants. Both towns owe their importance to the trade in the salt of the lake. The town of Nawa lies within the Jodhpur State, but that of Sambhar, together with some villages in its vicinity, is the joint property of both Jodhpur and Jaipur. The State administration at Sambhar is a dual one; there are two chief magistrates, two police magistrates, and two officials of every rank, one half owing allegiance to Jodhpore and the other half to Jaipur. The revenue is shared equally between the two States, and it speaks well for the good feeling of the native officers that this joint administration can be carried on. The towns of Sambhar and Nawa arose to their present positions on three considerations—the existence of drinkable water in sufficiently large quantities, facilities for the manufacture of salt, and the lines of trade routes. At both Sambhar and Nawa the surface level of the country slopes somewhat steeply down to the lake, and a good supply of drinkable water is available in the higher strata of the soil. There is good water available on a part of the northern shore of the lake also, though in lesser quantity; but elsewhere, where the country bordering on the lake is low-lying, the water is brackish. The eastern end of the lake under the town of Sambhar is somewhat narrow and this affords facilities for manufacture which have been availed of from the earliest times. At Nawa also, the lake is somewhat narrow, and this circumstance, together with a supply of drinking water, permits of the advantageous production of salt. Finally, before the construction of railways, the two towns, which are about twenty miles apart, were adapted by their position for the supply of salt along different lines of traffic; those lines radiating to the south and east from Sambhar, and to the north-east and north from Nawa.

During the year 1870, in view to reducing the cost of Sambhar salt to the many millions of British subjects who consumed it, by improved methods of administration and facilitating the carriage of the salt to areas of consumption by the construction of a railway, the British Government obtained the lease of the lake from the Jodhpur and Jaipur States for an annual payment of ₨700,000 (equivalent to about £47,000), on the condition that if the sales of salt exceeded 1,725,000 maunds (equivalent to about 64,000 tons) in any year, forty per cent of the sale price of such excess would be paid to the States as royalty. The lake has therefore been in charge of British Officers for the past 29 years, and the methods of manufacture will now be described.

The monsoon rains, which cease during the month of September, are followed by about nine months of practically rainless weather, and in the dry atmosphere of that part of Rajputana, the brine of the lake rapidly increases in density and the production of salt is effected under the influence of solar heat. Salt is obtained by three methods: from permanent salt works constructed in the bed of the lake and called Kyars; from shallow

solar evaporation pans of a temporary nature constructed on the lake shore; and from enclosed sections of the lake bed on which salt forms, so to speak, spontaneously.

A Kyar is a salt work constructed in the bed of the lake by enclosing a rectangular space with an embankment of lake mud from five to seven feet in height, pitched with stone to protect it from the main body of lake water. Within the enclosure, large solar evaporation pans are excavated, with pathways between, and brine is run into these pans from the lake by gravitation to a depth of from twelve to sixteen inches. Evaporation by solar heat (and the heat at the lake during the summer months is intense and continuous) results in the precipitation of salt, which forms in a soft crust from two to three inches in thickness on the bed of a pan. When the salt is ready for extraction, and this occurs on the brine reaching a density of about 30° Beaumé, labourers enter a pan with baskets, the crust is broken up, and the salt, after being washed with the bittern, is carried to a storage platform by the side of the enclosure, and is there stored in oblong heaps, with their sides sloped to an angle of about 36 degrees and each containing about 2,000 tons. The salt produced is white and of very good quality. It forms in four-sided pyramids, lined with steppes, the crystals varying from half an inch to as much as an inch in length. It is curious that the best type of Sambhar salt, with the most perfect form of crystal, is obtained from a depth of about twelve inches of saturated brine with a density of 25° Beaumé; a greater or a lesser depth of brine results in the production of smaller and irregular crystals. A salt work of the type described permits of manufacture being carried on even when the lake is so full of brine that a sufficient area of the shore is not available for the production by other methods; the supply of brine for the pans can be so regulated and manufacture can be carried on in such a manner as to obtain the best description of salt the lake is capable of producing; and during a year of scanty rainfall, the pans in it can be filled for a full crop of salt before the small quantity of brine in the lake recedes towards its centre. There are at present eleven of these salt works at the lake; ten in the vicinity of the town of Sambhar at the eastern end, and one near Nawa on its north-western shore. The size of their rectangles varies from 1681 feet by 951 feet, to 4150 feet by 1446 feet. The smallest enclosure contains 20 solar evaporation pans, each 421 feet by 152 feet, and an evaporating surface of 28½ acres; the largest has 60 pans, each 670 feet by 200 feet, and an evaporating surface of 184½ acres. The entire evaporating surface of the eleven existing enclosures covers an area of nearly 736 acres, and during a good manufacturing season, with all conditions entirely favourable, their productive capacity is about 200 tons an acre. The bittern which remains in the pans of the enclosures is pumped out into the lake by centrifugal steam pumps, and at the close of a manufacturing season, the pans are cleaned out and prepared for the next year's crop.

When after the close of the rainy season, the brine of the lake begins to recede towards its centre, shallow solar evaporation pans about 100 feet in length by 50 feet in breadth are made along the line of the lake shore, by scraping aside the soft surface mud and with it enclosing rectangles with ridges of about a foot in height. Narrow channels are run from these pans to the water's edge, and the brine is lifted into them with the aid of slung baskets lined with skins and each worked by two men. The brine in the pans is kept at a depth of three or four inches until a sufficiency of salt has precipitated. The salt is scraped up by means of small pieces of plank attached to long handles, is placed in conical heaps near the pans, and is finally carried on carts and animals to storage grounds above high-water mark and there stored in oblong heaps similar to those in which the salt of the Kyars is placed, the quantity in each heap amounting to as much as about 4,000 tons. The salt produced in this manner is white and of good quality, but the crystals are small owing to the shallow depth of brine in which they are formed. During a favourable year, from 4,000 to 5,000 of these pans are worked and occupy a length of about 15 miles of the lake shore.

Marketable salt is obtained from the bed of the lake in the following manner. When the brine of the lake has reached a high specific gravity and is beginning to recede towards the lake centre, it is enclosed within sections of the lake bed by means of rough retaining walls from eighteen inches to two feet in height, built of double lines of stakes lined with grass (*Saccharum Sara*), and the space between, about two feet, filled with lake mud. The sections of the lake bed so enclosed are situated within easy distance of the shore, and where the retaining walls are not likely to be affected by the main body of water when this is agitated by storms and strong winds. The mud of the lake, even within a short distance of the shore, is as much as two feet in depth, and it is so soft that it is not practicable to collect salt in heaps except at places not far below high-water mark. Salt which forms in these enclosures has therefore to be carried by labourers in baskets to points on the shore where the ground is hard enough to admit of its being collected in quantity, and consequently it is not economical to work beyond a certain point in the lake bed, as the cost of carriage of salt by labourers increases in greater proportion than the distance traversed. In addition to this, though the water in the lake is shallow, its extent is so great that it has considerable force when agitated by strong winds, and retaining walls built beyond a certain distance from the shore are liable to be swept away. An enclosure of the kind described having been constructed, endeavour is made to maintain the brine in such quantity as will result in a depth of about twelve inches at saturation point (25° Beaumé), and this is done by admitting a fresh supply at intervals when the brine of the main lake is banked up against the enclosure by a favourable wind. When the salt is ready for removal, narrow pathways are made by placing layers of grass upon the soft mud of the lake bed, and these are used by labourers for entering the enclosure and leaving it with basket loads of salt. Within the enclosure, the men wade into the soft, black mud, carefully lift the crust of salt (which is from two to three inches in thickness) by placing their outspread fingers below it, and collect it in their baskets. In these, it is carried along the pathways already described to the nearest point where firm ground is available on the shore, and is there collected in conical heaps. It is finally conveyed on carts and animals to storage grounds above high-water mark, where it is stored in the same manner as the produce of the solar evaporation pans worked on the lake edge; in fact the same grounds are used for the storage of both descriptions of salt. This spontaneous salt is of good quality, and the crystals are similar in shape and size to those obtained from the Kyars, though the colour is not so white. During a

favourable season for manufacture, the parts of the lake bed enclosed in the manner described, cover in the aggregate about six square miles.

In the case of salt obtained from the Kyars and enclosed parts of the bed of the lake, its collection is effected by daily labour and the work is paid for from day to day. The labourers, as they collect the salt, form it into small pyramids, pouring it out of their baskets on the apex of each so as to obtain the correct angle of repose as nearly as possible. The size of these pyramids varies with the industry of different labourers, but the quantity of salt in them averages about five hundredweight. The quantity of salt in each pyramid is estimated by the measurement of the angle of repose (which is about 36°), and this is effected by means of a graduated rod marked so as to show at a glance the quantity of salt in a pyramid of a certain height and of a certain measurement along the slope of its side. The day's work having come to a close, the measurement of each pyramid is effected with the rod, the quantity is recorded by the officer supervising the estimation, and the wage due to the labourer for the work done is placed upon the pyramid, the apex of which is knocked off for the purpose. When manufacture is active about 4,500 persons are engaged in the collection of salt and daily payments are practicable only in the manner described. The salt collected each day is estimated, paid for and stored by evening, and each labourer returns to his home with the money which he has earned in his possession. The procedure followed is very popular. As soon as the collection of salt commences, labourers resort to the lake from long distances, and live in small huts erected in the vicinity of the salt works from materials (grass, &c.) given to them for the purpose. The collection of salt which forms in the Kyars is not unpleasant work, but in wading in the mud of the enclosed parts of the lake bed, the bare feet and legs of the labourers are often cut by salt crystals and festering sores occur. This, however, is not heeded, as payments are regular and liberal, and a man whose feet or legs have been affected takes up other work until he has recovered and then returns to collect salt.

During the hot season, the collection of salt begins with the dawn and ceases at about 10 or 11 a.m., as about the approach of midday the brine and mud of the lake become scalding hot, and no man dare enter the lake mud during the afternoon. Severe injuries have occurred through neglect of this precaution. The solar evaporation pans on the lake edge are worked by petty contractors, each man working a set of ten or twelve. The salt is estimated in the manner already described, but instead of each pyramid being paid for separately, one payment is made for the total quantity obtained from a pan, as in each case only one owner is concerned. Immediately after estimation, the salt obtained from the Kyars is at once thrown up into large store-heaps on platforms provided besides each of these salt works. The salt of the pans on the lake edge and that obtained from the lake bed, is collected on the firm ground of the shore nearest the places of production in conical heaps of about twenty tons each. From these it is removed on carts, pack buffaloes, bullocks, and donkeys to the storage grounds above high-water mark. All salt is stored in the open, and though it is thus exposed to the vicissitudes of the weather, the climate is so dry that the loss sustained from rainfall is not as great as it would be in moister atmosphere. The cost of the manufacture and storage of salt at the lake amounts to about 13 pence a ton. This does not, of course, take into account the sum paid for the lease of the lake, the cost of supervision, and the capital expenditure on the construction of salt works.

It will have been noticed that manufacture of salt at the lake is dependent upon the monsoon rainfall. This greatly varies from year to year, and the outturn of salt fluctuates in accordance with the quantity of brine in the lake. The greatest quantity produced in any one year has been about 260,000 tons, and during a year of excessively heavy rainfall only about 3,300 tons were obtained. The total quantity obtained during the past 29 years that the lake has been worked by the British Government amounts to more than $3\frac{1}{2}$ millions of tons. The quality of the salt is good, as it contains from about 96 to more than 98 per cent of chloride of sodium, and it is the favourite salt of the people who inhabit Rajputana, Central India, and the North-Western Provinces and Oudh.

Before a line of railway was extended to the lake, salt used to be conveyed to areas of consumption on carts, camels, and pack bullocks. Supplies taken to the north and east were conveyed over the sandy country on camels principally, while the pack bullocks of the wandering tribe of hereditary carriers named Banjaras were the means by which salt was carried into the then wild regions of Central India to the south and south-east. The Banjara trade of the lake was at one time of great importance. Droves of pack bullocks, numbering as many as 10,000, used to visit it, arriving with much ceremony, the principal man of each drove being mounted on a handsome horse and attended by an escort bearing a flag and kettledrums. These Banjaras were traders, carriers, and distributors combined; they purchased salt, conveyed to areas of consumption on their bullocks, and retailed it from town to town and from village to village. The extension of railways and the more settled and peaceful condition of all parts of the country has affected this description of trade; salt can be cheaply and expeditiously transported in all directions by railway, and the great droves of Banjara bullocks escorted by armed men are no longer to be seen anywhere. A few of these picturesque wanderers still visit the lake yearly, but the number is small, and as railways extend still further, this description of trade will cease. There are now great facilities for the removal of salt by railway from the lake direct to areas of consumption. The Sambhar branch of the Rajputana Malwa Railway runs to the town of Sambhar, crosses the eastern end of the lake on an embankment to its northern shore, a distance of about five miles, and then skirts that shore to the town of Nawa ten miles further on. All of the storage platforms of the Kyars in the bed of the lake, and the storage grounds on its edge, are connected with the main line of railway by sidings; the aggregate length of these latter is about fifteen miles, and bags filled from the heaps of salt can at once be placed in railway waggons standing within easy distance. The salt is sold at nine shillings a ton, and for a further payment of sevenpence a ton, the British Officers at the lake undertake to clear the salt by railway to any destination. This convenience is largely availed of. Traders resident in areas of consumption many hundreds of miles distant, pay the price and the small fee for clearance into the nearest Government treasury or post office and send the necessary empty bags to the lake, whence their

salt is sent to them expeditiously by railway. In Central India, the Indian Midland Railway also receives salt revenue in this manner at different railway stations, and the system conduces to the cheap distribution of salt, by which the consumer benefits. The salt of the lake is widely distributed. It is largely consumed in Rajputana, Central India and the North-Western Provinces and Oudh. It is exported into the Panjab and the Central Provinces, and is also consumed in the Himalayan State of Nepal.

The Sambhar lake, of which the writer was in charge for five years, is not a desirable place of residence. The country is arid, the heat great, and when the lake is drying up the stench from decaying insect and vegetable forms, which flourish when the brine is weak and die off as its density rises, is very offensive. But the scenery shortly after the rainy season is worth a visit. Standing on the low sand ridge at the eastern end of the lake, on which the salt officers have settled, the spectator would see below him the white buildings of the town of Sambhar, and beyond a vast sheet of water bounded to the westward by the hills and ridges of the Aravali range, with the white houses of the town of Nawa nestling in trees on the edge of the lake, about twelve miles away, in a direct line. Nearer, he would notice the railway line crossing the eastern end of the lake on a high embankment, the large salt works which have been described, snow-white heaps of salt of about 2000 tons each dotted here and there, and crowds of labourers engaged in the collection and storage of salt. He would also see thousands of flamingoes appearing like pink clouds as they rose in flight. These birds resort to the lake soon after the annual rainfall and live upon the insect life with which the lake teems while the density of the brine is low. They migrate as soon as the specific gravity of the lake increases and all insect and vegetable forms are destroyed by the rising density of the brine. There is, however, a reverse to this picture, as the appearance of the locality is very different during a season of drought. The monsoon rainfall of 1899 failed throughout Rajputana, which is suffering at the present from the most severe famine of the century. But little water entered the Sambhar lake and it is at present perfectly dry. It has not been possible to obtain salt from pans on the lake or from the lake bed, and but little brine could be taken into the Kyars. The country round the lake is at present desolate and a picture of sterility, and the stir and bustle usual on the lake works in connection with the collection of salt is wanting. Variations of this kind are to be looked for in the sandy portion of Rajputana where the rainfall is a very uncertain factor.

The Pachbadra salt source is situate in Jodhpur territory and is next in importance to the Sambhar lake as a salt-producing locality. Pachbadra is a small town of about 5,000 inhabitants. on the right bank of the Luni river, and at a distance of about 40 miles to the south-westward of the city of Jodhpur. The State of Jodhpur is also termed *Marwar*, the Land of Death, and the name is an appropriate one as regards the part of the country in which Pachbadra lies. The town is some distance from the Luni river, a dry water course with a bed of glaring sand, except during brief periods of the monsoon when it comes down in flood. The low-lying ground between the town and the river is waterless and sterile, while to the west and north the interminable sand hills and ridges of the Great Desert begin and extend over a vast area; stretching about 200 miles westwards towards Sindh and to a greater distance northward to the Panjab.

Ten miles to the westward of the Luni river, and about two miles in the same direction from the town of Pachbadra, a large sandy valley takes its rise from the desert sand-hills and extends for a distance of about twelve miles, with a breadth varying from one and a half to two miles. It follows a south-westerly course parallel with the Luni for some miles, and then turns to the eastward and joins that river. The eastern edge of the valley is bounded by rising ground of hard soil, capped here and there by hills and ridges of blown sand, and sloping towards the Luni river; while to the westward the sand-hills of the desert form one unbroken line. The origin of the valley is obscure, but it is possible that in post tertiary times an arm of the sea extended up the Luni valley to the neighbourhood of the city of Jodhpur, the Runn of Kutch being of course an inland sea, and that the valley in which the Pachbadra salt source is now situate was an inlet of the sea. The present height of Pachbadra above the sea is about 360 feet, and the sand of the desert can apparently only be satisfactorily explained by supposing that it was derived from a former coast line.

The Pachbadra salt source occupies a section of about $5\frac{3}{4}$ miles in length by $1\frac{3}{4}$ miles in breadth of the upper end of the valley. Under this area, brine springs exist, and it is from this brine that salt is manufactured. The springs are found in a bed of clay and nodules of carbonate of lime lying about 11 feet below the present surface, and excavations which have been made show clearly the past history of the valley. The stratum in which the brine springs occur is covered by a layer of coarse sand and gravel, and this was evidently the former bed of the depression. Above this there is a stratum of sand and clay; then another of layers of sand, silt and salt crust; above this a stratum of deposits of silt and desert sand with lines of washed sand and salt crust between; and finally a surface stratum of blown desert sand. These indications go to show that in the past the bed of the valley was about $8\frac{1}{2}$ feet below its present level; that it was a salt marsh which was periodically inundated and in which salt formed during the dry season of each year; and that it has been filled up to its present level by deposits of blown sand. Bounded as the depression is to the westward by a vast sea of desert sand, it would have been overwhelmed long ere this by advancing sand waves, but for the curious fact that the strong winds which prevail during the summer months blow from a south-westerly direction, and as these pass over comparatively hard ground in the vicinity of the Luni river, their effect in filling up the valley with sand has been comparatively slow. The present appearance of the upper part of the valley, where salt is manufactured, is that of a slightly undulating sandy plain on which clumps of *Salvadora olesides* occur here and there. Lower down the valley, the accumulation of sand is not as yet so great, and the general level is more uniform and barren. In this lower section also, brine is found below the surface, and formerly salt used to be made at two localities, but production is how confined to the upper part of the valley.

Local tradition in regard to the past history of the valley is in accordance with the illustrative indications afforded by excavation. It is related that in former times, when the country was more sparsely populated than it is even now, the bed of the valley was a saline marsh in which salt used to deposit during the dry and hot months

of the year, and the wild aboriginal tribes of the neighbourhood used to collect this salt for their own consumption and for sale to the inhabitants of the adjoining desert. About 400 years ago, a man named Pancha, a Jat (agriculturist) by caste, lived in and owned a small desert hamlet which stood upon the present site of the town of Pachbadra. That town takes its name from that of Pancha Jat, *Pancha-padra*, Pancha's fields, corrupted to Pachbadra. The story goes on to relate that a man of the Kharwal (salt manufacturing) caste named Jhanja had occasion to travel from his home in the Udaipur State, about 150 miles to the eastward, and visited Pancha's hamlet. He noticed the formation of salt in the bed of the marsh, and recognising the value of his discovery, settled down in the hamlet and commenced the systematic collection and sale of salt. He was joined by other Kharwals from the country to the eastward and it was in this manner that the present community of about 200 households of Kharwals in the town of Pachbadra took its rise. Several of these families claim descent from the original founder of their settlement, Jhanja Kharwal. For some time after they commenced to work in the salt marsh, Jhanja and his fellows contented themselves with collecting the salt which formed spontaneously in hollows here and there. At last, they discovered that brine springs existed not far from the surface and a small shallow pit was dug to the level of these. The result was satisfactory, as a better description of salt was obtained from the subterranean brine, and the collection of inferior spontaneous salt was abandoned. Later, it was discovered that the best crystals of salt formed upon the thorny branches of desert shrubs which were blown by accident into the pits. Experiments were made and it was found that the thorny twigs of the *Lycium Europæum* were best adapted for the purpose, as they did not decay in the salt brine and the long thorns facilitated the formation of large crystals.

The alleged discoveries of Jhanja and his brethren form the basis of the methods of manufacture which are followed at the present time. These methods are peculiar to the locality, and are so entirely adapted to local conditions that no improvement upon them has been found practicable. Pits of an average length of 230 feet, with their banks sloped to an angle of about 45 degrees, are dug in the bed of the valley to a depth of about eleven feet, until the subterranean springs of brine have been tapped, and these become filled to a depth of about three feet with strong brine varying in density from about 20° Beaumé to saturation point (25° Beaumé). To promote crystallization and to encourage the growth of large crystals, branches of the thorny *Lycium Europæum* (locally termed *Morali*) are thrown into the pits, just as the formation of an overset of salt indicates that precipitation has commenced, and are lightly packed in the brine. During the great heat of the months of April, May and June, and in the dry atmosphere of the desert, the evaporation of the brine exposed in an open pit is very rapid; and as this proceeds and salt is precipitated, more brine flows in, until the pit is filled to a depth of about three feet with salt. This formation is not complete for about two years, two hot seasons being necessary for the precipitation of all of the salt a pit is capable of containing up to the level to which the brine can rise. When the salt of a pit is ready for extraction, the owner and his labourers assemble, provided with baskets, heavy poles shod with iron in the shape of a chisel, and broad long-handled hoes. The mass of salt in the pit, which is held together by thorny branches embedded in it, is cut into sections by the iron-shod poles and is so removed. The salt having been extracted, its crystals are shaken off the thorny branches, which are then thrown aside, and it is stored in one or two oblong heaps on the bank of the pit. After the extraction of the salt, the pit, in which brine has again collected from the springs, is carefully cleaned out and thorny branches are again placed in it when it is found that precipitation has recommenced. Crop after crop of salt is thus obtained at intervals of two years, the outturn from a pit amounting to an average of 370 tons every second year.

The area of the source is about ten square miles, and the quantity of the underlying brine varies in different parts of it. The eastern half produces salt in large, heavy, solid cubes, but the brine springs are weak, the supply of brine scanty, and on this account manufacture in that part of the valley has been practically abandoned. In former times, however, work in that direction was very active, as the whole of the eastern part of the source is studded with abandoned pits which are gradually being filled with blown sand. The reason for the failure of the brine springs is not apparent. Along the line of the desert sand-hills to the eastward, there is an abundance of brine available, and it is in that direction that the pits at present worked are situated. The salt obtained from these is white and of good quality, but the crystals are smaller than those which are obtainable from the brine of the eastern half of the valley. This description of salt, however, suits the present requirements of markets better than that which used to be produced in the eastern half of the valley, so that the failure of the brine springs in that direction does not affect the trade. Pachbadra salt is considered to be one of the best of Upper India. It is white, clean, and of good crystal, and contains from about 97 to 98 per cent of chloride of sodium.

As at the Sambhar lake, so here also the salt source is held to be under the protection of a goddess mother. It is said that some years after the original manufacturer of salt, Jhanja Kharwal, settled at Pachbadra, it was revealed to him in a dream by the goddess Sambrarai (Sakambri, the consort of Shiva) that stone images of herself and of her sister Asaprai were buried under a *Jhal* tree (*Salvadora olesides*) in the centre of the salt source; that he was to exhume the images, build a temple for them and worship them; and that if he did so, the goddess would endow him and his descendants with wealth so bountifully that they would be richer than if they had been given a silver mine. Choosing an auspicious day, Jhanja dug up the images and built a temple for them close by, which stands to this day, though it has since been enlarged, and is now a more pretentious building than that which was originally erected by Jhanja. There is an inscription in the Hindi character engraved upon the image of Sambrarai which shows that the temple was built in 1514 A.D., and has been standing for 385 years. The shrine is maintained by the contributions of the salt manufacturers and the pious Hindus of other castes in the neighbourhood.

In 1878, the British Government obtained the lease of the Pachbadra salt source from the Jodhpur State for an annual payment of ₨170,000 (about £12,000), and the manufacture and sale of salt has been under the control of British officers for the past 21 years. It has been found that no improvement can be effected in the methods of manufacture which have been followed by the salt workers for generations past, as these are entirely adapted

to the peculiar local conditions. There are now 270 pits from which supplies of salt are obtained. The productive capacity of the source is great, as the salt-producing area is large and the underlying brine is abundant, but the number of pits now being worked is sufficient to meet trade demand. The pits are the property of the manufacturers, from whom salt is purchased at 2s. 3d. a ton. Payments are made in the first instance on the basis of cubic measurements of heaps as these are completed; and later, when the salt of a heap has been issued to the trade, the account is adjusted by taking the actual weight, and the manufacturers thus receive payment for every ounce of salt they produce. Unlike the Sambhar lake, Pachbadra is not dependent upon the rainfall for the production of salt, as the brine springs are perennial. Salt is obtainable even in the worst year of drought, but with a good rainfall the brine is somewhat diluted, and as a consequence of prolonged evaporation, salt forms in larger crystals under such conditions. The rainfall is extremely capricious, and climatic conditions are characteristic of the desert country. During the season of the south-west monsoon, the only time of the year when rain falls in an appreciable quantity, immense masses of cloud come up from the direction of the Runn of Kutch and pass over to the north-westward without precipitating moisture except erratically. The average annual rainfall is about 15 inches, but fluctuations are very great. During the monsoon of 1892 as much as 48 inches of rain fell, while the fall of the monsoon of 1899 was only .93 of an inch. It is this wide range in the annual precipitation of moisture which causes sterility. A sudden and heavy fall of rain produces no permanent effect, as the water speedily disappears in the sand, and the droughts which succeed parch vegetation. In addition to this, the heat at Pachbadra is very great. During the months of May and June the hard level tracts of country along the Luni river become intensely heated, and the south-west wind, which passes over these, reaches Pachbadra as a fiery gale laden with dense clouds of heated sand. Under these conditions, the thermometer has been known to rise to 122° in the shade, and this temperature, with a gale of wind blowing and the atmosphere so thick with flying sand that it is impossible to discern objects at a greater distance than about a hundred yards, is intensely felt. As a result of the great heat, the capricious rainfall and the sterility of the country, there is great difficulty in obtaining a supply of drinking water at the source. There are no wells of sweet water in the valley or anywhere in its neighbourhood, as brine is found everywhere below the surface. The town of Pachbadra is dependent upon tanks, in which the drainage of the hard soil in its vicinity collects during the monsoon. There are three tanks of the same description along the eastern slope of the valley, in which a certain quantity of water accumulates; and in parts of the bed of the valley some drinkable water is obtainable a few feet from the surface where the underlying strata are hard enough to prevent the accumulation of surface drainage from sinking to the level of the brine springs. But these sources fail as soon as the summer heat commences, and then water has to be brought in iron tanks by railway from wells on the banks of the Luni river, ten miles distant.

Pachbadra salt is sold at 2s. 10d. a ton; and, as at the Sambhar lake, for the further payment of sevenpence a ton, the British officers at the source undertake to despatch salt by railway to traders carrying on business in areas of consumption. As the source is situated in the desert, the trading community avails itself very largely of this convenience, and practically the whole of the salt removed yearly by railway is bagged and despatched under arrangements made by British officers. During the 21 years that the source has been worked by the British Government, about 465,000 tons of salt have been produced, and the present yearly trade of the source amounts to about 30,000 tons. Before the construction of a railway, Pachbadra was a favourite resort of the wandering carriers and traders called Banjaras. At the commencement of each monsoon season, as soon as water and fodder became available, these men used to leave the Aravali mountains and travel over the sterile country westward to the Pachbadra salt source with their droves of pack bullocks. At that time practically the whole of the trade of the source was in the hands of Banjaras, who used to arrive every year with thousands upon thousands of pack bullocks. The town of Pachbadra owed its rise to these annual visits of Banjara carriers, as the bankers who settled in it carried on business with the leaders of the different parties and trade of all descriptions resulted. But with the extension of a branch of the Jodhpur and Bikaner railway to Pachbadra, the Banjara trade has declined greatly, and now comparatively few of these wanderers visit the source. At present, all but a small percentage of the salt sold is removed by railway, and the Banjara trade is practically at an end. Pachbadra salt is widely distributed and the areas within which it is consumed include Rajputana, Central India, the Central Provinces, and the North-Western Provinces and Oudh.

Though in the summer season the valley of the salt source is a scene of desolation, yet it is preferable to the dreary desert which lies to the westward of it. The subsoil moisture is saline, but owing to its existence the roots of the grass in the sandy surface retain some little vitality, and at the commencement of the summer the desert rats migrate to the valley in millions to feed upon these roots. Numberless snakes accompany these rats in order to prey upon them; snakes of all descriptions, from the hideous black cobra to the more harmless varieties. The most dangerous snake at the source is the *Echis carinata*, a fierce but sluggish viper, whose poison causes a lingering and horrible death from hemorrhage within the space of about three days. Other snakes, even the cobra, are timid, and will move away rapidly at the least sound. The small *Echis* does not do so, but coils itself up when it hears a footstep and strikes at the foot (generally the instep) of a passer-by if he happens to come within reach. The colour of the *Echis* is a dull grey, and it is difficult to see the snake at night when it is coiled up on the sand. The native shoe leaves the instep bare, and a number of men suffer annually from the bite of the *Echis*. In the case of persons treated in the hospital at Pachbadra, the subcutaneous injection of strychnine has been found to be a cure, and deaths from the poison of the *Echis* do not now occur when so treated. The people of the desert drink melted butter as a remedy and it is said that this often effects a cure.

The salt source of Didwana is situated in the State of Jodhpur and at a distance of about 40 miles north-west of the Sambhar lake. Leaving the town of Nawa on the north-western shore of the lake, the heavy road over the sand leads for fifteen miles to the town and fort of Kuchaman. About half way, a saline depression exists at the village of Sargôt and at the foot of one of the ridges of the Aravalis. Some water collects in this during the monsoon season and leaves a strong saline efflorescence on its evaporation during the dry months of the year. At Kuchaman itself, another and larger saline depression exists, which is annually filled with water from the drainage of the spurs of the Aravalis under which it lies. The depression is a miniature of the Sambhar lake in

its appearance and characteristics, except that but very little salt forms in it, and that little is so inferior as to be not worth collection. The Chief of Kuchaman is one of the principal Barons of the Jodhpur State, and his town and fort are extremely picturesque. The fort is built on the summit of an isolated conical hill, and the town nestles beneath it at the foot of its southern face. An abundance of sweet water is found not far from the surface, and the strong fort on the summit of the hill, the town at its foot, and groves and green fields around form a pretty picture in the midst of a sterile country. The bare and arid peaks and ridges of the Aravalis immediately to the south-west, and the barren-looking country to the west and north, enhance the picturesqueness of the scene. From Kuchaman the road runs north-west by north 25 miles to Didwana and thence onwards into the heart of the desert. At first the sandy undulations of the country are low, but as Didwana is approached they grow steeper, until at last from their summits the peaks of hills are discerned in the distance over the sea of sand. A few miles further, the country slopes slightly north-westwards and the salt source and its surroundings are seen. The source lies in a valley about $3\frac{1}{2}$ miles in length by $1\frac{1}{2}$ miles in breadth, running south-west and north-east, and bounded on its western side by an isolated spur of the Aravalis.

The town of Didwana lies to the north of the depression and at its north-eastern end. Considering the aridity of the country, it is of considerable size, its population numbering about 11,000; but before the railway was constructed to Bikaner the high road to the desert, which passes through it, was much frequented, and the existence of the salt source enhanced its importance and increased its business. The antiquity of the town appears to be considerable, and it is said to have been in existence about 2,000 years. It is related that on one occasion, when an excavation was being made, a stone idol was found bearing the date of Sambat 252 of the Hindu era, equivalent to 195 A.D. In digging the foundations of new houses and wells, articles of pottery have been found twenty feet from the surface. The general level has gradually risen above a very ancient temple in the town until only the top of its spire is now visible.

The valley in which the salt source lies has the appearance of having been the bed of a river. To the north-east and south-west it has apparently been overwhelmed with sand, but its continuation in both directions can be distinctly traced. The prevailing wind is from the westward, and the depression as it exists has evidently been saved from the advancing waves of sand by the spur of the Aravalis in that direction contiguous to it, which has served as a protection. Local tradition is to the effect that the valley was once a river which flowed from the north-eastward and which became choked with sand higher up in its course. The western edge of the valley rises somewhat abruptly, but to the eastward the general level slopes gradually towards it. About half a mile of each end of the valley is cut off from the central portion by earthen embankments thrown across, and these serve to prevent the drainage of either end from flowing into the central section. This central portion forms the salt source and is about $2\frac{1}{4}$ miles in length. The bed of the source is composed of black tenacious mud, very similar in appearance to that of the Sambhar lake, and a stratum of strong brine underlies it, varying in density from about 20° Beaumé to very nearly the saturation point. Some water collects annually in the source during the season of the monsoon rains, but this is rapidly evaporated during the dry months, leaving a thin crust of salt over a small area in its centre. Except during the rainy season, the bed of the source is dry and covered with a profuse efflorescence composed of sodic chloride, sulphate, and carbonate.

The method of manufacture is exceedingly simple. Wells are dug in the bed of the source until the brine springs are reached at a depth of about 12 feet from the surface. The upper stratum passed through is composed of the black mud of the source, soft towards the surface but gradually hardening to the consistency of soft shale at a depth of about 10 or 12 feet. The brine springs occur in a bed of calcareous matter below the stratum of black mud. When this lower stratum is reached, the inrush of brine becomes so strong that further excavation becomes impracticable, and a heavy beam shod with iron is then used (it is lifted by a number of men and allowed to fall by its own weight) to pierce the brine stratum as much as possible. As soon as the spring has been effectually tapped in this manner, the brine rises in the well with a swirl, emitting bubbles of offensive sulphuretted hydrogen gas as it does so. The emission of the gas indicates that the spring has been reached and that a constant supply of brine can be safely calculated upon. The brine rises about six feet above the spring level and the supply is inexhaustible. The wells are roughly lined with wood for a few feet from the surface and most of them have been worked for centuries. They have to be cleaned out occasionally to clear the spring orifice, but that is all. After the excavation of a well, the next step is the construction of one or more solar evaporation pans of a rectangular shape near it. These are prepared by removing the mud of the surface to a depth of from six to twelve inches, and roughly levelling the exposed area. Brine is then lifted from the well by a weighted pole and bucket, and is allowed to flow into the pan. At first, the bed of the pan absorbs very nearly the whole of the brine, and for a few years the outturn of the pan is small in quantity, and it is discoloured by the black mud of the pan bed. But gradually large crystals of a form of sulphate of soda form in the mud, and these increase in number year by year until their accretions form a solid and hard bed; so hard that a pickaxe would be needed to break through it. In some of the pans, these crystals form a stratum about two feet in thickness. When its bed has consolidated in this manner, a pan is capable of producing clean white salt in large quantity. Brine is run into it from the well to a depth of from two to three inches, and as salt forms it is scraped up into low ridges with a wooden instrument formed of a section of plank attached to a long handle. This ridging of the salt is steadily carried on from the time precipitation first commences until the crop is ready, the position of the ridges being moved from day to day so as to immerse all the crystals in the brine daily. This is necessary, as the brine is of so great a density that salt forms in the channels along which it flows from the wells, and when it enters the pan precipitation occurs almost immediately and, of course, in very small crystals. The hardness of the beds of the pans assists rapid evaporation, as during the summer months they become so heated that the manufacturers cannot enter a pan with bare feet after about midday. By collecting the salt in ridges and moving these about in the brine, the size of the crystals is increased and many of them adhere together in lumps about the size of small marbles. When care is taken in manufacture, a large proportion of the crop obtained from a pan is composed of these agglomerations, each of which consists of a number of small cubes of salt joined together by salt brine. When it is found that the salt in a pan has sufficiently developed as regards the size of its crystals, and such a quantity

has formed as to render the daily moving of the ridges laborious and difficult, it is collected in heaps in the pan and then removed to a place of storage on its edge. Didwana salt is white and clean, but owing to the high specific gravity of the well brine and rapid precipitation, its crystals are always small. It contains from 95 to 98 per cent of chloride of sodium. The salt pans are about 80 feet square and are each capable of producing a crop of from 10 to 12 tons of salt every 15 days. There are two clusters of factories; one of 222 pans and 46 brine wells on the southern edge of the depression, covering an area of about one half by a quarter of a mile; and the other on the western edge, where 25 pans and 7 brine wells are scattered along a line of about 400 yards.

The greater number of the salt factories have been in existence for centuries. But few pans and wells have been constructed in recent times, and there are no traces of old works to be seen, except a few at the north-western end of the source, which were abandoned about 22 years ago in view to the concentration of manufacture at its south-western end, where the brine is more abundant and of better quality. It is said that manufacture has been carried on by the present class of workers for about 400 years, and there is no tradition of salt having been produced prior to that period. But in 1878 an experimental well was sunk on the eastern edge of the source on a somewhat high level, and an excavation laid bare the mouth of an ancient well at a depth of about 8 feet from the present surface level. This well was about 3 feet in diameter and 10 feet in depth; its bottom was just above the brine springs and a beam of wood was lying across its mouth. It was quite different to the wells at present worked and there is no tradition of salt having been produced so high up on the edge of the depression. It was sunk when the level of the source was 8 feet lower than at present, and it must have been in use at a very remote period in the past. Salt manufacture at this source is probably of great antiquity.

In 1878, the British Government obtained the lease of the Didwana source from the Jodhpur State for an annual payment of ₹200,000 (about £13,000), and it has been worked by British officers for about 21 years. During this interval no change has been made in the methods of manufacture, as it has been found that those followed by the *Deswals* (as the manufacturers are called) are best adapted to local conditions. There has been no extension of work, as the factories which were existing have been capable of producing as much salt as the trade requires. Indeed, much more than is needed can be produced, and work is confined to about two or three months in each year. The supply of brine is abundant and inexhaustible, and in the dry climate of the desert, manufacture can be carried on continuously for nine months in the year. The rainfall has no effect upon the salt producing capabilities of the source. The fall is confined to three months of the monsoon (July, August and September), and though the average is about 15 inches, yet the yearly quantity varies greatly, fluctuating from as much as 23 inches to as little as 3 inches.

During the past 21 years, about 300,000 tons of salt have been produced at this source. Payment is effected in the same manner as at the Sambhar lake. When salt is extracted from the pans, it is placed near them in small pyramids containing from three to five hundred-weight; the quantity in each of these is estimated by means of a graduated rod, and each manufacturer is paid at once for the salt he has produced. After estimation, the salt is collected in heaps near the pans, and is finally conveyed in carts to storage grounds above the bed of the source, and is stored in large oblong heaps each containing as much as 4,000 tons. There is a storage ground near each of the two clusters of factories; one on the western and the other on the eastern edge of the depression. Though the source is not liable to be flooded except in its centre, yet the mud of its bed becomes extremely viscid with the least moisture (by which it is readily affected, owing to its salinity), and salt has to be removed to the sandy edge of the depression for the convenience of the trade. It has already been remarked that the mud of this source is very like that of the Sambhar lake, and it is liable to become heated to a high temperature in a similar manner. Towards the end of May, 1877, when the writer was in charge of Didwana, an unusual fall of rain occurred, flooding the centre of the source, and followed by intense heat. One of the native establishment attempted to cross the depression in the heat of the day, at a narrow part, where the mud and water were less deep than elsewhere, and up to a little below his knees. When he got about half-way across he found that the soft mud was scalding hot and shrieked for help. His comrades on the hard ground near the edge dare not venture into the mud and urged him to pass through as quickly as he could. He struggled through the heated mud with great difficulty, and fell exhausted on the shore with his feet and legs terribly scalded. He was carried to hospital and some months elapsed before he was able to walk.

The cost of manufacturing Didwana salt and storing it for sale on the edge of the depression is tenpence a ton, and it is sold at the rate of 1s. 8d. a ton. The railway has not been extended to this source, and the nearest railway trading station is 40 miles distant at Nawa on the Sambhar lake. The trade of the source amounts to about 12,000 tons annually. Didwana salt is consumed in the north-western portion of the Jodhpur State, in the Bikaner country to the north, in the Jaipur State to the eastward, and a little is exported to the Kotah and Bundi States south of the Sambhar lake. The principal trade is with the eastern districts of the Panjab, to which the salt is conveyed partly across the intervening desert country and partly by way of the Sambhar lake and the railway thence. Some is also consumed in the submontane districts of the North-Western Provinces. Camels are principally used for the removal of salt from the source, and in the desert country these animals are the cheapest and most expeditious means of carriage. Salt for the surrounding country is carried away in the small carts of the desert, and during the monsoon months a few Banjaras visit the source when grass and water are available for their pack bullocks on the trade routes leading up from the southward. Though the manufacture of salt is not affected by the rainfall, yet a failure of the monsoon affects the trade of the source prejudicially, as during seasons of drought (common in the desert country) water and fodder are scarce on the trade routes.

The three sources which have been described (Sambhar, Pachbadra and Didwana) are the principal salt-producing localities in Rajputana. There are two others at which salt is manufactured; Lonkaran Sarr in the Bikaner State, and Kanôd in the State of Jaisulmer. These are worked by the officials of the States in which they are situated.

The source of Lonkaran Sarr is situate in the heart of the southern desert and about 50 miles to the north-

ward of the city of Bikaner. A depression exists in the desert, about two miles in length by one and a half in breadth, and below the bed of this, springs of saline brine are found at a depth of about 14 feet. The surface of the depression is sandy with the underlying stratum of tenacious dark grey clay, below which the brine is found. Excavations in the shape of pits are made down to the spring level, and the brine so reached varies in density from 13° to 20° Beamé. The salt is produced in large solar evaporation pans of a rectangular shape and about 50 feet square. These are constructed by removing the sandy surface of the depression and excavating the required area in the clay substratum to a depth of about 12 inches. Two brine condensers are constructed in connection with each pan and on a somewhat higher level. Brine is lifted from the brine pits by the aid of a weighted pole and bucket and run into the condensers, from which it is allowed to flow into the pans. A crop of salt is obtained from a pan in about 10 or 12 days during the summer months of the year, and the cost of manufacture is about 3s. 4d. a ton. The salt is of small grain and somewhat discoloured by the clay of the beds of the pans and blown sand, but its quality is fairly good, as it contains about 93 per cent of chloride of sodium. The manufacture is very limited, only about 1,100 tons of salt are produced annually, and consumption is restricted to the desert country of the Bikaner State.

The Kanôd source is situated in the centre of the Jaisulmer State, in the southern desert, and in country even more desolate than that of Bikaner. The writer visited this source during the summer of 1877, and has a very vivid recollection of the journey. Starting from the south-eastern corner of the State, the route lay at first over sterile stony country and then over enormous sand-hills. Desert villages, clusters of a few small huts constructed of stems of the *Asclepias Gigantea* and desert grass, were met with at intervals of 20 and 25 miles, and guides had to be obtained to travel from point to point. In that country, no man starts abroad without a water-skin slung over his shoulders; even the camel herds, who do not move far from their villages, carry these skins. Water is scarce and brackish, and wells are 300 feet and more in depth. The salt source lies at the head of a rocky valley which separates the stony desert from the sandy and waterless one which extends northward for about 100 miles to the Bahawalpur State on the river Sutlej. Brine underlies a low-lying and barren area of about a mile square, and at a depth of about 10 feet. Pits are dug to reach the brine, which is lifted by the weighted pole and bucket. A few inches below the surface of the source, a bed of bluish, impermeable clay is found, and solar evaporation pans are excavated in this. Brine is exposed to evaporation in these pans, and a small-grained, white salt is obtained. The desert country is so sparsely peopled that only about 500 tons of salt are produced annually.

Besides these sources at which manufacture is at present carried on, there are many other depressions in Rajputana at which salt can be produced. None of these are of the type of the three principal sources, but all of them have a substratum of brine within workable distance of the surface. One of these localities lies in the Jaipur State, at the villages of Kachôr and Rewasa and at a distance of about 30 miles north-west of the Sambhar lake. North of Didwana, and at a distance of about 20 miles from that town, there is a saline depression named Chapar Tal, near the town of Sujangarh in the Bikaner State. Westward, and in the extreme north-western corner of Jodhpur territory, there is a very large depression about 15 miles from the town of Phalodi, called the Phalodi salt source. This source is about 5 miles in length by 3 miles in breadth, and brine underlies it at a depth of about 9 feet from the surface. Large quantities of salt could be readily produced at this source. It was worked by the British Government for some years, under a lease from the Jodhpur State, but manufacture has ceased for some time past as it was found to be unprofitable. The source is distant about 100 miles from a railway, and as the country around is desolate and very sparsely populated, the smallness of the demand prevents it from being profitably worked. Added to this, the average annual rainfall is only about 9 inches, with great fluctuations, and there is great difficulty in obtaining a sufficiency of drinking water. About 50 miles south-west of the Phalodi salt source, another large saline depression exists near the town of Pokaran in the Jodhpur State. This is about four miles in length by two in breadth, and brine underlies it at a depth of about seven feet. Salt has been manufactured in the past, but the position of the source in a desert country and at a distance of about 100 miles from the nearest railway prevents it from being profitably worked.

Finally, the Luni salt source may be mentioned. The Luni river has already been described. At its mouth, where it enters the Runn of Kutch, a large delta has been formed by the annual floods, with numerous deep channels. During the dry months of the year, when the bed of the main stream is perfectly dry, brine percolates into these channels and salt of good quality forms in thousands upon thousands of tons annually, only to be swept away when the river comes down in flood during the monsoon. Salt also forms in a sheet over the end of the Runn itself when the wind causes an accumulation of brine at its head. An attempt was made many years ago to utilise these collections of spontaneous salt, but it had to be abandoned as there was not a profitable demand. The country around is desolate and thinly populated, and drinking water is scarce. The nearest railway station is about 80 miles distant, with a difficult and desert country to traverse. The Runn is an immense level expanse of mud extending as far as the eye can reach. Looking south-westward from the mouth of the Luni river, the peaks of the hills which lie on its western shore can be seen 50 or 60 miles away appearing over the sea of mud as they would over an expanse of water. The immense sand-hills of the desert appear to the westward, while all around is desolate and drear. The desert antelope and gazelle are to be met with about the head of the Runn, and the wild ass roams along its shore. The scene is desolate beyond description.

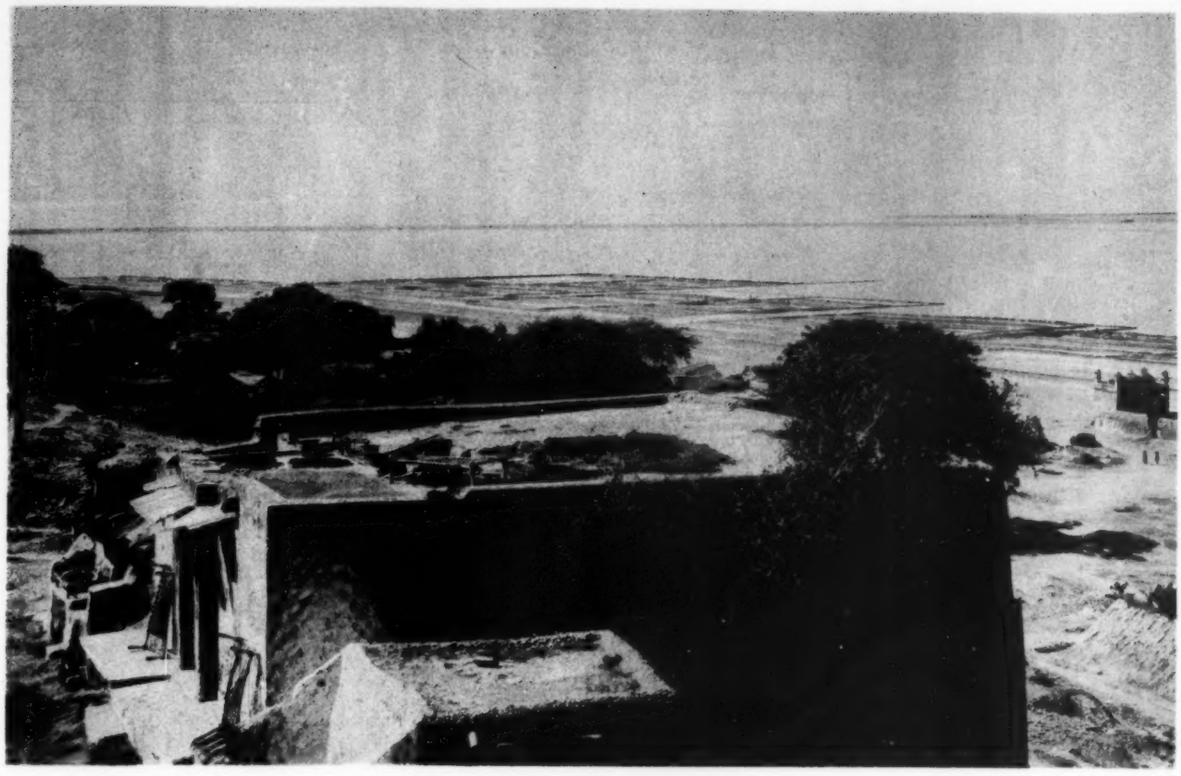
ILLUSTRATED BY 59 VIEWS, ETC., ON 17 PLATES (48—64).

1

2

SAMBHAR SALT LAKE.

48 { 1. View of the lake looking westward from the town of Sambhar.
{ 2. Another view of the lake.



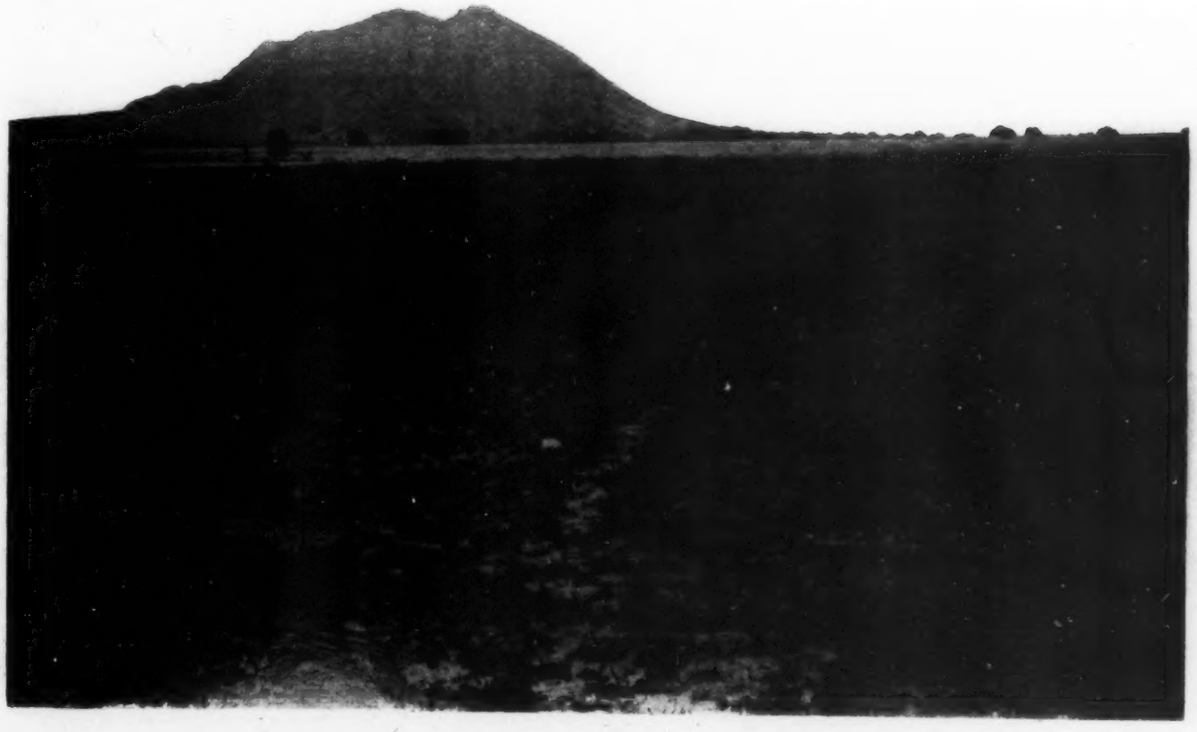
3

4

SAMBHAR SALT LAKE.

49 { 3. A third view of the lake.
4. View across the eastern arm of the lake.

5



6

SAMBHAR SALT LAKE.

5. View across extremity of the eastern arm of the lake.
6. Hill on south-western shore, the dry bed of the lake in the foreground.

7

8

SAMBHAR SALT LAKE.

51 { 7. Mata Pahar, the hill of the mother, the goddess mother Sakambri.
8. Collection of salt in an evaporation pan of a Kyar near the town of Sambhar.

9

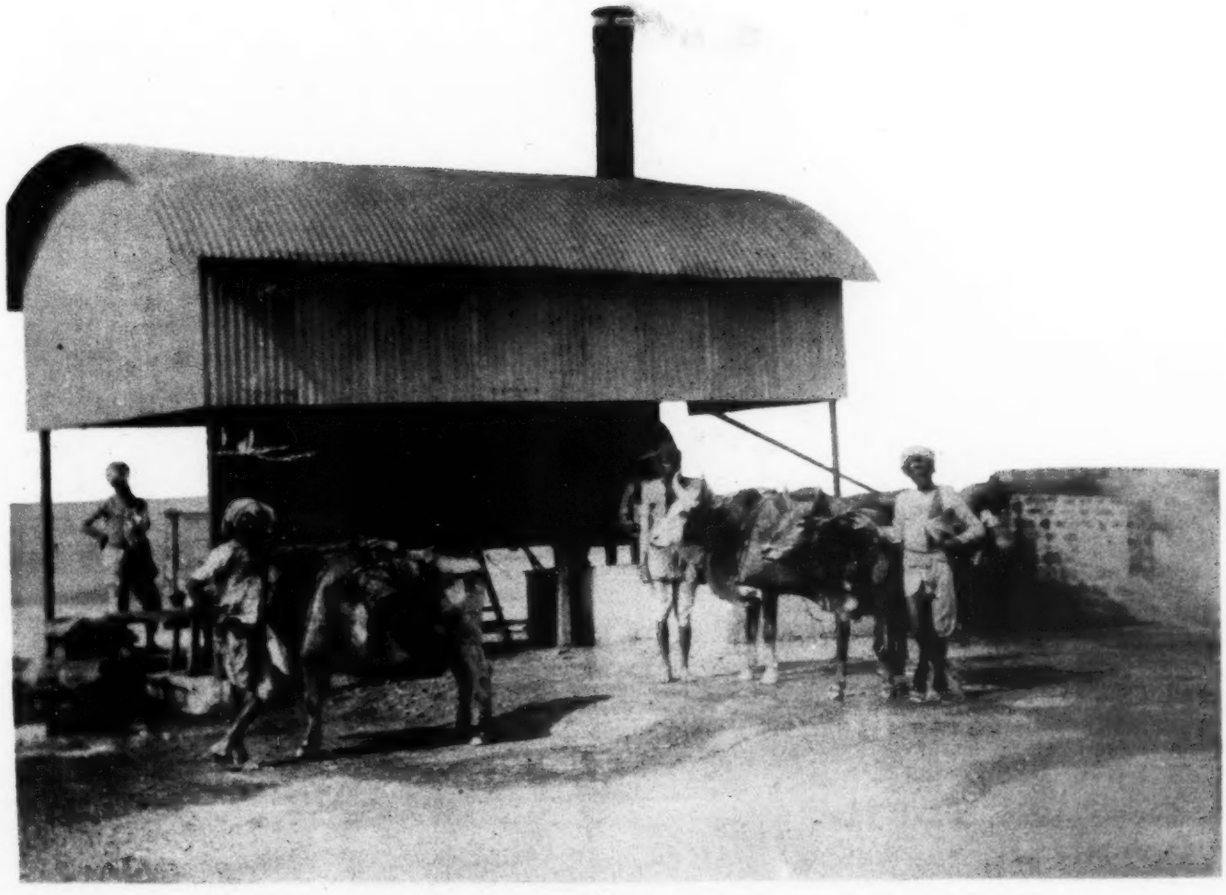
10

11

SAMBHAR SALT LAKE.

52 { 9. Another view of work in a Kyar.
10. A third view of work in a Kyar.
11. A fourth view of work in a Kyar.

12



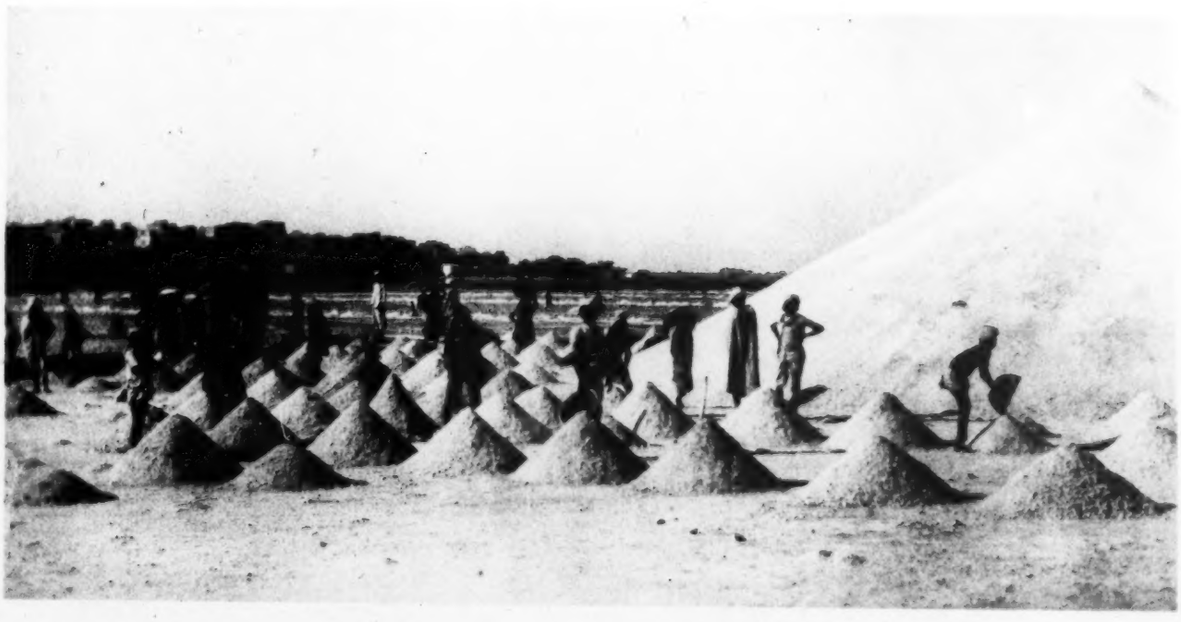
13

SAMBHAR SALT LAKE.

53 { 12. View of part of the Kyar at Nawa.
{ 13. Centrifugal pump and engine at the Sambhar Kyars.

14

15



16

SAMBHAR SALT LAKE.

54 { 14. Collection of spontaneous salt from the bed of the lake.
15. Another view of the collection of spontaneous salt.
16. Preparing salt for estimation.

17. Salt being prepared for estimation.

18. Estimation of salt on a storage platform of a Kyar.

55.—Sambhar Salt Lake.

19

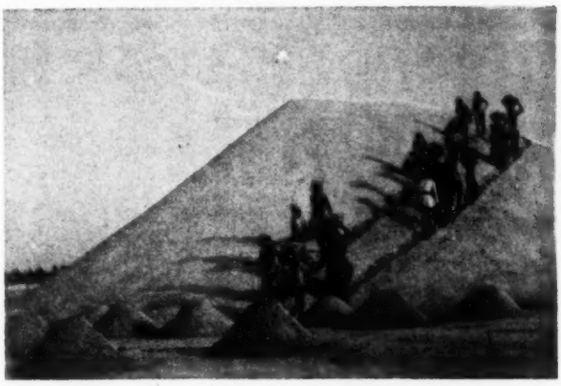
20

SAMBHAR SALT LAKE.

56 { 19. Estimation of salt of evaporation pans on the lake edge, the town of Sambhar in the left background.
20. Salt being stored in a heap.

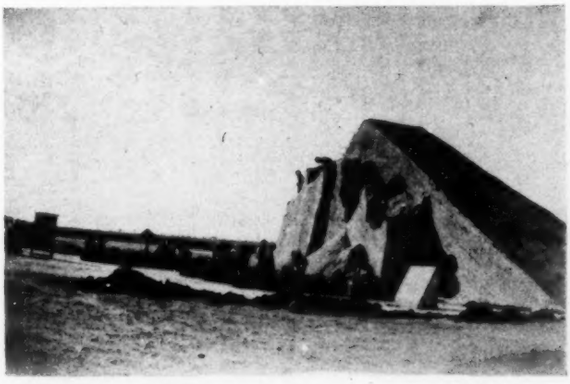
21. Labourers carrying salt.

22. Salt being stored.



23. Another view of salt being stored.

26. Bags being filled with salt.



27. Bags being filled with salt.

28. Bags being filled with salt.

57.—Sambhar Salt Lake.

24

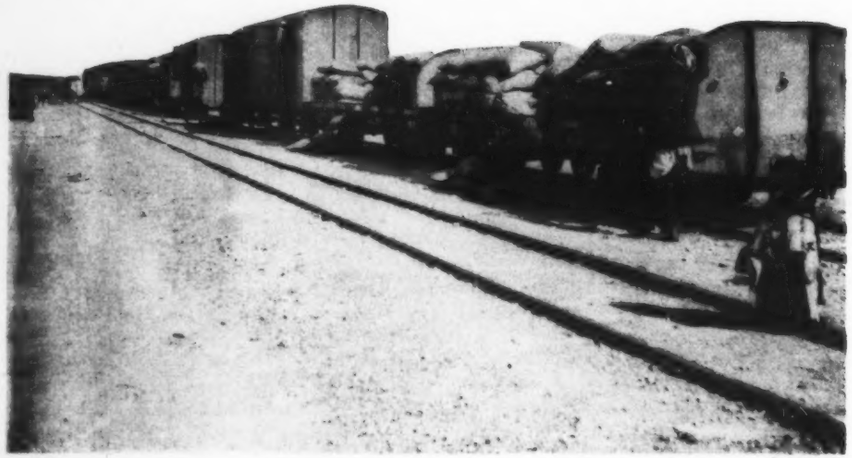
25

SAMBHAR SALT LAKE.

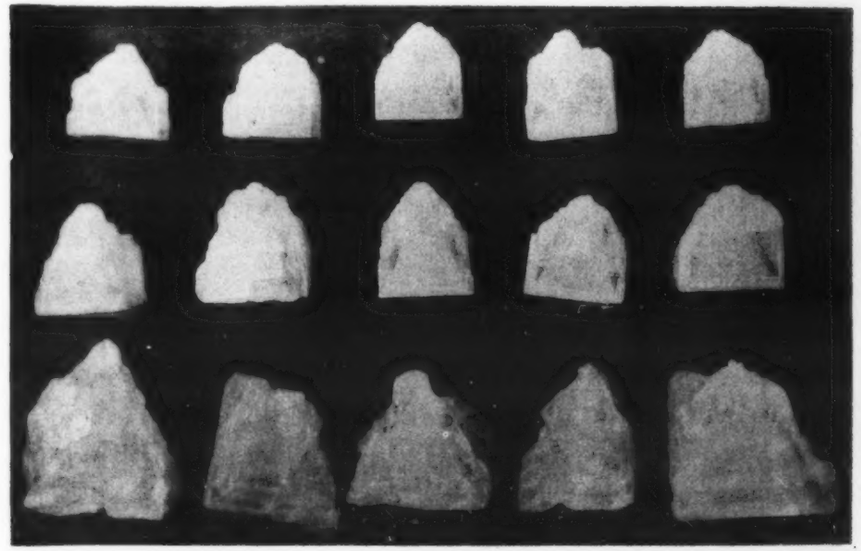
58 { 24. Heaps of salt on a railway siding at the Sambhar Kyars.
25. Bags being filled with salt for despatch to traders.

29. Salt being weighed and loaded in railway wagons.

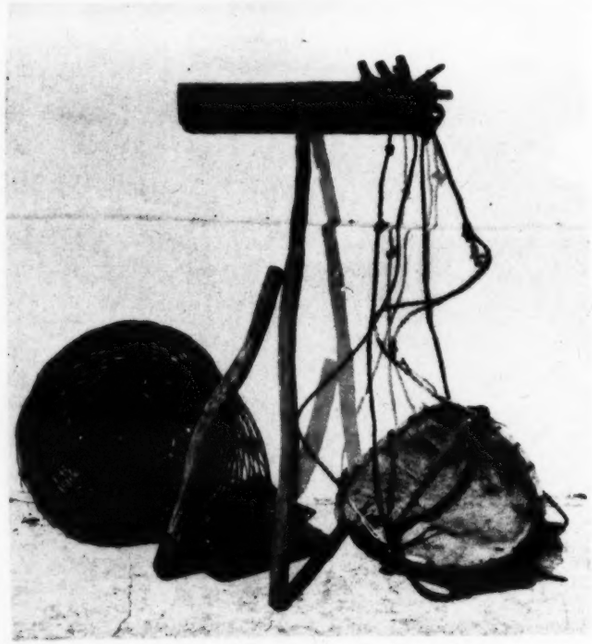
30. Railway wagons being loaded with salt.



31. Railway train loaded with salt.



32. Crystals of Sambhar salt.

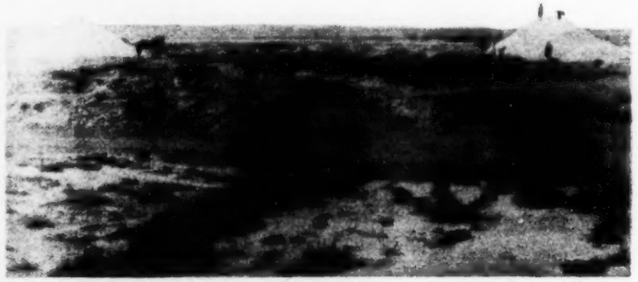


33. Implements of salt manufacture.

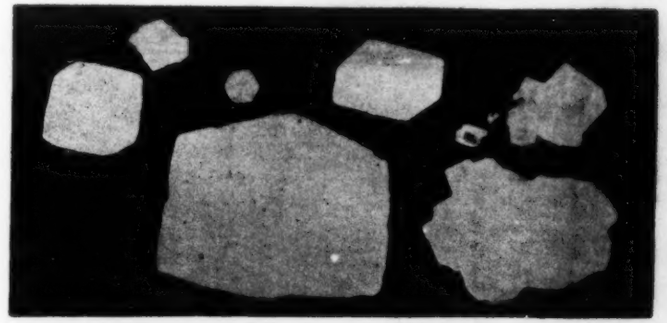
35. View of the town of Nawa.

34. Settlement of salt officers near the town of Sambhar.

60.—SAMBHAR SALT LAKE.

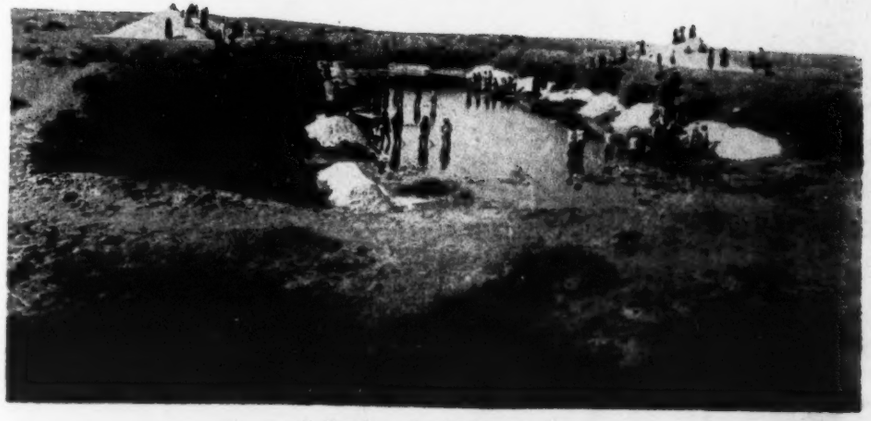


40. View of a salt pit, with heaps of salt on its banks.



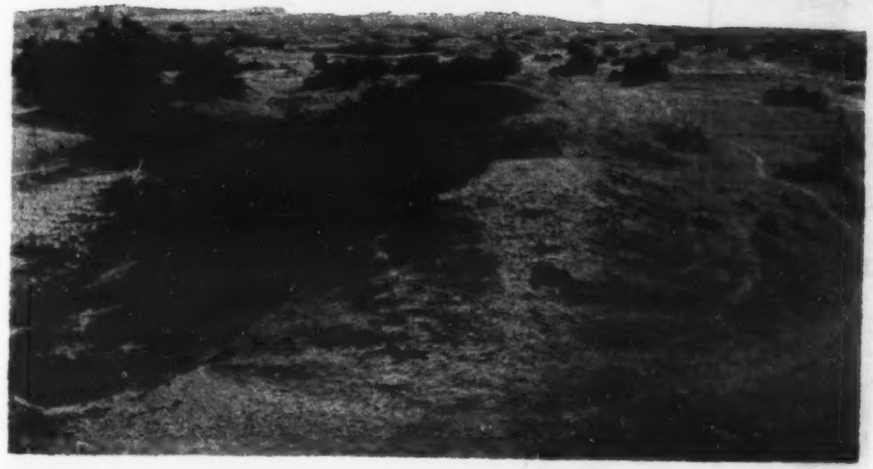
43. Crystals of Pachbadra salt.

36. Salt officers' houses near the town of Nawa (Sambhar).



39. Collection of salt, from a pit.

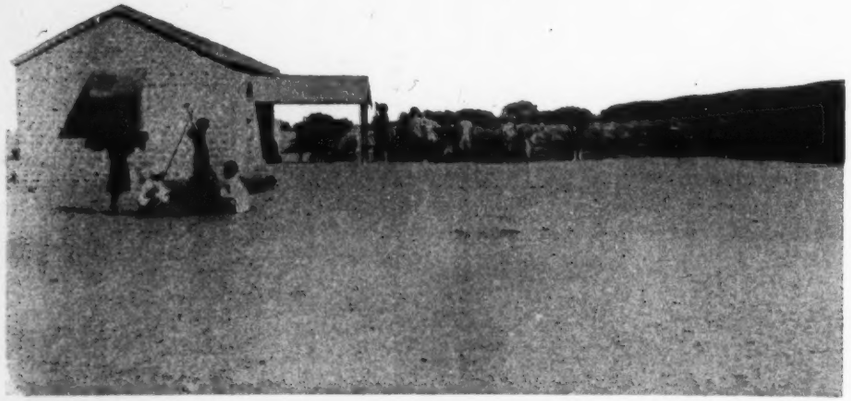
37. View of the salt source, looking south-westward.



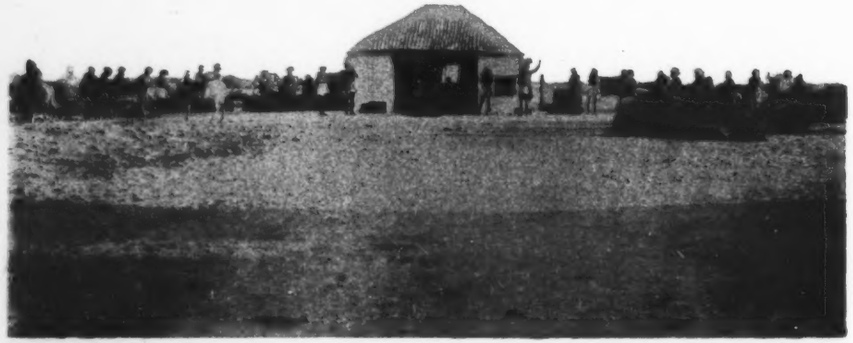
38. Another view of the source, looking southward.

61.—Pachbadra Salt Source.

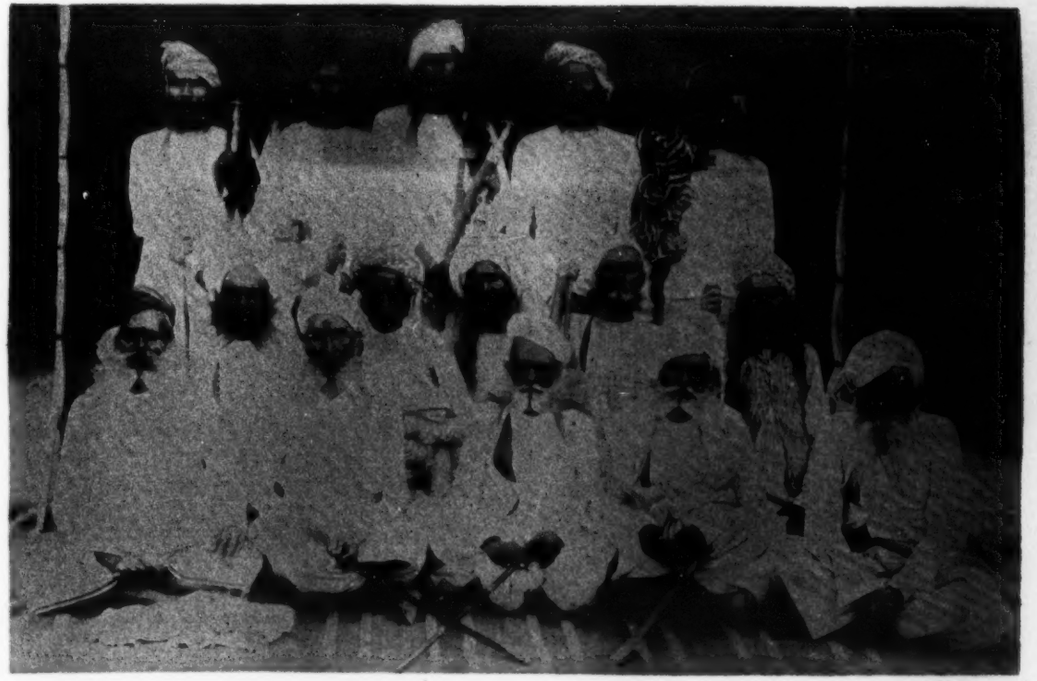
44. Salt being sent from a pit to the railway station.



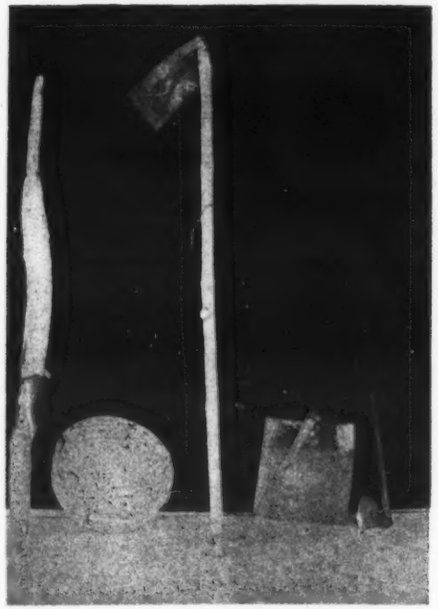
45. The railway station; salt being despatched by railway.



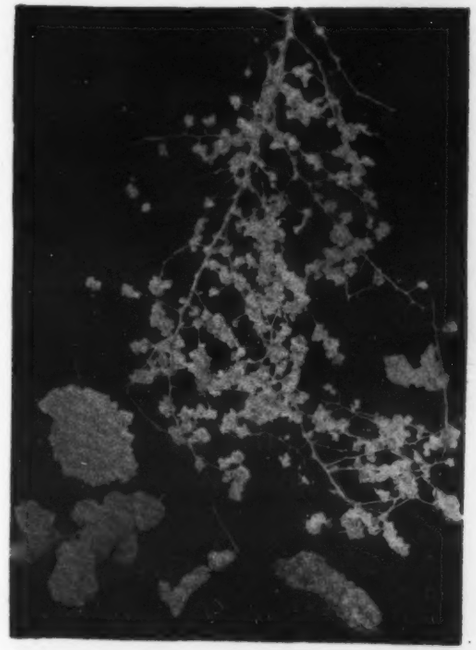
46. Salt being weighed out to Banjara carriers.



47. Salt manufacturers of Pachbadra.

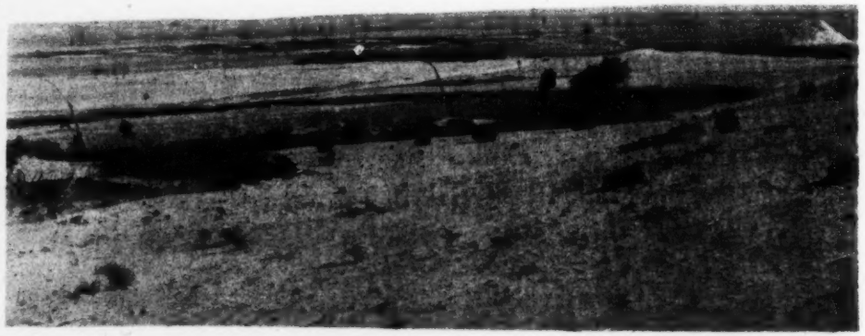


41. Implements used in salt manufacture.



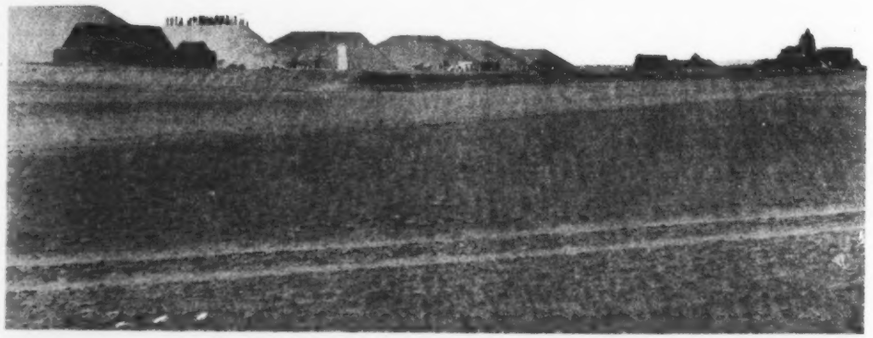
42. Salt adhering to a branch of *Morali*, Lycium Europeum.

62.—Pachbadra Salt Source.

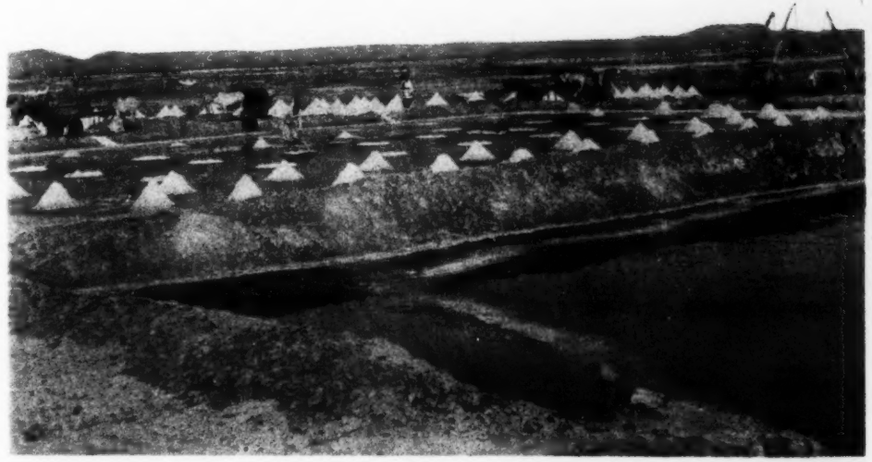


49. View of salt source, looking south.

50. Another view, looking west.



52. View of storage ground.

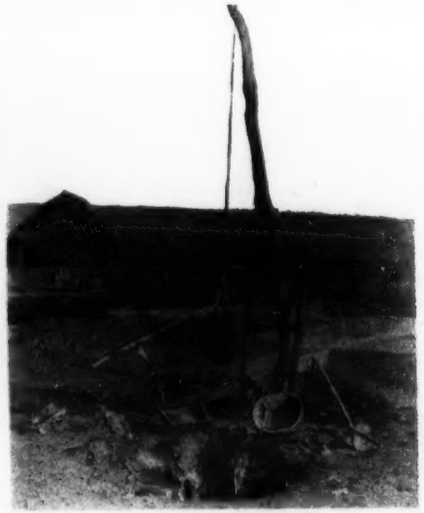


51. View of a salt factory.

48. Temple of the goddess mother Sambrarai (Pachbadra).

63.—Didwana Salt Source.

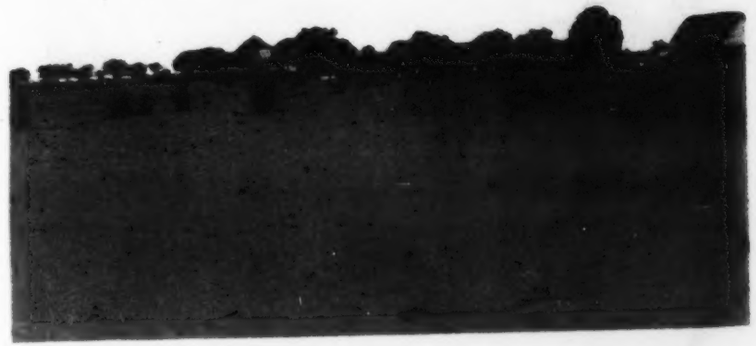
55. Salt manufacturers of Didwana.



56. Brine well.

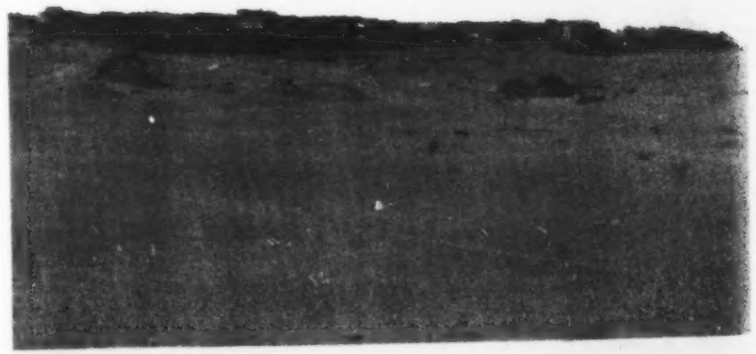
57. Crystals of Didwana salt (magnified).

54. Salt being weighed out to traders.



58. Officers' house.

53. Bags being filled with salt.



59. View of the town of Didwana.

The Journal of Indian Art and Industry.

ON SOME SPECIMENS OF INDIAN METAL WORK.

By J. H. RIVETT-CARNAC, Esq., C.I.E., F.S.A., *Indian Civil Service (retired)*,

Colonel Indian Volunteers; Aide-de-Camp to H.M. the King.

Of recent years, thanks to the liberality of residents in India, and travellers interested in the handiwork of the peoples, various collections of Indian metal work have been exhibited at the Imperial Institute. Before these loan collections were broken up, some photographs of selected specimens were made. Several of these plates are now to be published in the *Journal of Indian Art*, and as a description of a collection of Hindu deities and sacrificial implements was recently published by me in this journal, I have been requested to contribute a paper to accompany these plates, relating to the classes of Indian metal work which have come under my notice during a long residence in India.

This interesting subject has been fully treated at various times in standard works, such as Sir George Birdwood's *Industrial Arts of India*,[1] and in several papers published in this Journal, which, unfortunately, are not available to me at present for reference. As some into whose hands the separate issues of the *Journal of Indian Art* may come, will possibly find themselves in the same position, it may be permitted to return to this subject, to attempt a brief sketch of this class of Indian manufacture as presented by my own experience as an old collector, and to add some notes as to the localities in which the best types are available, together with a note of warning against the danger of the "European improvements" which are being introduced, and which are steadily undermining the form of much that is excellent in Indian design.

Although some localities are specially celebrated for their manufacture, and for superior excellence in pattern and treatment, there is hardly a large bazaar in India in which fine specimens of metal work may not by good fortune be picked up, with the aid of some patience, good-humour and tact. Nearly every good-sized village has its "cunning worker" in metal. The profession in its various branches is a caste, or guild, and the boy learns and follows his father's trade from an early age, and whilst heredity supplies the touch, and possibly the good taste, he has the specimens and the knowledge of the old forms handed down, and adhered to by his conservative surroundings. The very neediest class of the community, with hardly enough food to keep themselves alive, with but little raiment, and the thinnest of thatch over their heads, may be limited to earthen pots as water and cooking vessels. But the first stage in improvement in condition is to metal vessels, which even the poor can command, and which there is a local industry to supply in iron, brass, or copper. The next stage in advance is to the precious metals. The rich *bunniah* or merchant may have his *lotah*, or water vessel, and some other accompaniments, of silver, whilst, at the native courts, the Maharajah or favourites may run to gold for their paraphernalia, attaining even to gold ornamented with enamel and precious stones, as may be seen in some of the specimens from the collection of the Earl of Powis, brought home by the great Lord Clive, and which, it is hoped, will come under notice in the second part of this paper. The ordinary family, however, must have gone very far before the ordinary metals are discarded for domestic utensils. Those who are well set up in brass or copper pots and pans are well-to-do, and these are the chief assets when the household goods come to the hammer, and when there is no land to satisfy the money-lender's claim.

Besides all these, there are the many beautiful articles in the richer metals which, whether ornamented with precious stones or not, are called jewellery. It is proposed in this paper to notice the vases, and similar work made in copper, brass, and sometimes in silver, and to leave a brief description of the higher class of manufacture for the second part to be published in the succeeding issue of this journal.

The ordinary brass and copper household vessels, pots and platters, turned on the wheel and then hammered, are without ornament, and the scrubbing and cleaning they undergo would soon remove any tracery. Their shapes are good; the *lotah*, or water vessel, taken originally from the gourd, and the larger brass vessel in which water is kept in the corner of the homestead, are familiar from the many specimens imported of late years as ornaments into every part of Europe. The industry is common to every part of India, flourishes in the Deccan, and of old days, when the Ganges traffic was important, and the road from Bombay struck the river at Mirzapur, that place was celebrated for the manufacture, some portion of which is still retained. The brass sacrificial vessels give more opening for taste, as will be seen from the illustrations in the paper recently contributed to this journal. Some specimens of copper vases for holding Ganges water—of melon shape, the colour deepened by age—which have been collected by me, are remarkably beautiful. Pilgrims to holy places carry away reminiscences of their visits; and sacred Benares, close to Mirzapur, was always well supplied with *lotahs* and other brass work from that city, and has itself a considerable manufacture. On these *lotahs* it was the fashion to engrave the *das avatar*, or ten incarnations of the god Vishnu, and the ornamentation was carried on to the platters and other brass goods of the bazaar. The work took the fancy of the European visitors of Benares, greatly multiplied by the increased facilities of travelling. Every visitor carried away several specimens, which in the early days had some merit of execution. The work then became the fashion, as it was comparatively cheap, and lent itself to decorative purposes, and large quantities were exported to Europe, and specimens are now to be seen in almost every continental city. With the increased demand, necessitating large numbers of pieces being turned out in a hurry, the work degenerated, the engraving being carelessly executed. What is called Benares brass is not now so much in

[1] *The Industrial Arts of India*, by Sir George Birdwood. K.C.I.E., C.S.I., &c.

favour, though well selected specimens have their value, some of the bowls being very effective and handsome. The chief fault in the work is, the figures of the deities do not stand out sufficiently, the engraving being shallow. With some difficulty, a brass bowl, with gods in high relief, was secured by me, the work being hammered repoussé and bold: this, however, is the only specimen I have seen, and it will be figured in a later plate. Of late years all sorts of European shapes, covered with Hindu gods, have been introduced into the Benares brass manufacture, and the philistine tumbler and mug, and other well-known forms, are constantly to be seen, requiring only the legend "A Present from Benares," to make them quite complete for the British market. These European "improvements" are doing much to demoralise the local metal industry, just as the introduction of aniline dyes and foreign patterns is affecting the textile fabrics and carpets of famous Indian manufacture.

The manufacture of the various metal objects used in Hindu worship, which is brisk at Benares, is not affected by outside influence, and, as will be seen by the plates in the paper published in a former number of this journal, many beautiful forms, and much excellent workmanship has survived. Of the hundreds of thousands of Hindu pilgrims who flock annually to Benares from all parts of India, many bring with them their sacrificial outfit, besides their drinking vessels and other metal requisites. Of these, immense quantities change hands. A pilgrim spends more than he can well afford at the shrines, and to pay his way home must part with some of his possessions. Or he prefers new lamps to old lamps, and parts with a *lotah*, laboriously ornamented by a workman in the far-off Deccan, many years ago, and which may have been long in his family, for an up-to-date cup made in the holy city. And as the sick, the aged, and the feeble form a large proportion of the visitors, and as epidemic is not unknown, the deaths are numerous; and large quantities of metal articles, brought from every corner of India, and exhibiting every type of Hindu artistic treatment are left behind, and find their way into the bazaars. These used generally to go to the melting-pot, being little prized for their forms by the dealers. Many years ago, whilst prospecting in the Benares bazaar, one of our party came across an old water-vessel of undoubted merit, and our eyes were opened to a veritable mine of wealth in artistic metal work, in every way immensely superior to the modern Benares goods then coming into vogue. We spent there an eventful and red-lettered afternoon. The ideas of all of us were pretty sound as to what we considered good, and there was little difference in our tastes. So it was arranged that we should forage separately in different quarters of the bazaar, and search the stores of the old metal dealers, collect all that seemed suitable, and divide the spoil at the end of the day. The astonishment of the native mind was unbounded, and it was some little time before the dealers could be brought to realize that we really wished for the oil-encrusted, discarded, dingy specimens heaped up in the corners of the back rooms, ready to be broken up for the melting-pot, rather than the bright tempting platters and vases of the main streets. We were all thought more or less cracked: but then the "Sahibs" are often more or less eccentric. Bushel loads of old metal ware were eventually turned out, and in the mass of rubbish there occasionally appeared a dainty lamp, a grotesque Ganesh, or an artistically engraved *lotah*—just as a valuable old coin may occasionally be met with in a cloth full of ordinary copper pice. These were set aside, and eventually paid for at the rate for old metal, and great was the astonishment and amusement of the owners when an extra rupee or so was thrown in, with the promise that we were open to deal on the same liberal terms on the morrow. The *dallals*, or brokers or touts, with which the bazaar swarms, were soon armed with samples, and rummaged the smelting shops in search of the "*purána chiz*," or old things.

The result of their researches were various, often successful, and occasionally comic. One would be pursued by a man with the upper half of a broken British candlestick in one hand; in the other, the remains of the metal-work of a battered cruet-stand, tempered by the presence of an enviable specimen of the best Nepalese brass, a delicately worked shrine-back entirely to our taste. Those were halcyon days for the searchers after the "*purána chiz*"; the supply was plentiful, and even with the largesse occasionally thrown in for encouragement, prices ruled low. Our party included amongst its enthusiastic collectors, the late Mr. John Campbell of Islay and Colonel Lord Ralph Kerr, whose houses still testify to the success of those early days; while the corridors of the old Habsburg Castle of Wildeck, our present abode, contain many relics of our expeditions. In the division of the spoil, first choice went by lot. The contents of our bags were spread out on long tables; each selected a piece in turn; no schoolboys in the distribution of "prog" could have been more scrupulously fair in their transactions, or more hilarious over their feast. Since those days the "*purána chiz*" research has been rather overdone; as no self-respecting tourist or visitor investing in the new work can now overlook the claims of the old brass and copper vessels. The brokers and dealers have learnt the trade, competition is keen, prices have risen, and when I left India, finds were few and the cost was commensurate. And thus it happened that in those days, a successful morning in the Benares bazaar might secure for one trophies of metal work, not only of local manufacture, but gathered under the conditions above noticed, from every part of India—the relics of the pilgrims to this far-famed shrine. In a few hours one might by good fortune collect varied specimens which only journeys to far-off provinces, or the chance presence there of sympathetic friends with a knowledge of one's tastes, could render possible. The variety in the patterns on the *lotahs* was great, and the distinctive treatment by the workmen of the various provinces was soon recognisable. To us, the most highly prized specimens came from the Deccan and Nepal, the latter state supplying profusely ornamented vessels in great variety. The melon-shaped, fluted copper vase, for holding a store of Ganges water, was a happy find, and one would carry it to a fellow-worker in a neighbouring street, with the triumph that one would display a woodcock early in the season. I have since, in an English drawing room, seen such vases holding the Maréchal Niel rose, and the contrast of hues is striking. The deities, in various sizes and forms also came under contribution, with grotesque and occasionally artistic claims. What was, however, generally most to be admired was the varied and graceful shapes of the vessels obtained in considerable variety, and which are now known to readers from the illustrations of this and other works on Indian Art. The best combination of colour is copper with brass, a favourite mixture—the one representing the Ganges, the other the Jumna river—*Gunga-Jumni*, as it is called.

Benares is not the only place in India where treasures are to be found. A ramble in any good-sized bazaar, if intelligently conducted, may bring with it successful results, which I have likened to the happiness of a good

bag of a pleasant day's sport. But, for success, this must be undertaken under conditions often difficult for the tourist. One must know something of the language, learn where to go, and how to manage the people. To be accompanied by the *Chupprassie*, or by the local policeman, who generally dogs the steps of the visitor, is fatal. One might as well stalk the *sambhar* accompanied by a gentleman performing on the french-horn. The *Chupprassie* has been likened by poor Aberich-Mackay to the colorado-beetle, and the native policeman is hardly behind him in his attributes. They both have an eye to perquisites, or percentage, or *dusturie*, or what the Indian, according to his standard, calls "*huq*," "one's due," and so accurately translated, according to British unsympathetic ideas, as "illegal gratification." The dealer will hardly open his stores in the face of such company, for any deal is discounted by the subsequent and enforced claim, by your attendants, of a share of the price paid. The company, too, of the inquisitive and rancid crowd of idlers, *dálals*, or touts and brokers, the *gamin* inevitable in India, as elsewhere, disturbs the game, and leaves you little chance, and, as in most sport, you must proceed quietly and cautiously, and work by yourself. If the dealer is flurried or alarmed he will not do business,—at least, not the sort of dealer you want: the man in the main street, with the bright British and Benares ware is never inaccessible. He with the old coins and the treasure-trove trinkets has them packed away in a back room, and does not wish the gaping crowd, or intelligent policeman, to know of their quantity or whereabouts. If you are quiet and he feels some confidence in you, he may, with a little persuasion, produce his stores. And then is your chance. One has carried back from India many a pleasant remembrance of successful hauls under what, at first sight, seemed unpromising conditions. And the cabinet of gold Gupta coins in the India Museum at Calcutta, and many specimens of art work in various other museums, testify to the result of one's rambles in out-of-the-way bazaars, and should encourage seekers after what is of interest and of real antiquarian value, hidden away in the stores of the metal dealers of all denominations, so many of which treasures, unfortunately, find their way to the melting-pot.

Nor need the search be limited to metal ware, to old coins, or the "*purána chiz*" in brass or copper. There is, or rather was, a virgin mine of valuables in many of the larger bazaars of the great cities of India, especially those which, like Lucknow, Agra, Delhi, and others, had been attached formerly to rich native courts. Some years ago, few thought of looking for old china in the hut of the man dealing out tobacco in small quantities, or in a squalid sweetmeat shop. A friend of mine discovered a valuable vase encrusted with dirt at such a tobacconists, who gladly accepted a couple of rupees for the specimen. And a sweetmeat-seller willingly allowed me to replace an old blue platter with a new dish, and was amazed when, out of ordinary decency, I felt constrained to add thereto several rupees, with a promise of good payment for similar specimens. But these finds soon became known. An enterprising European promptly covered the country with agents, who wisely bought up all the old china, and cases full of excellent specimens were shipped by him home during the year, and the proceeds well supplemented the modest salary in the depreciated rupee which he was receiving at an out-of-the way station in India. Since then the antiquarian dealer, unknown in India in my early days, has become an institution, and the bazaars are swept nearly clean, by his agents and himself, of everything of value and of interest, whether of metal work, or of manuscripts, china, coins, arms, embroideries, or what not. The local dealers, too, have been educated in the trade. For the tourist, or even the resident, there is not much chance left now in such regularly whipped water. Occasionally the practised angler gets a chance, and the many difficulties add some delight to success in the sport.

So much, then, for the old work. Those who content themselves with modern metal work have full opportunities in India of gratifying their taste, and there is much in many of these wares which may deservedly be appreciated, and in which a satisfactory collection may be made to decorate an Indian room in a western home. Enough has been said of ordinary Benares brass ware. A pleasant contrast to this will be found in the Tanjore work of copper encrusted with silver or with brass, and which is more elaborately treated in design and execution and has a higher merit and value Of this some specimens will be seen in Plate 72 which accompanies this paper. It is generally adorned with Hindu deities, accompanied by graceful tracery interwoven with the flowers and plants sacred to the service of the gods. The ornamentation is in relief, standing well out, and often carefully finished, and is not graved or scratched as on the Benares brass. But here also European improvement is affecting the shapes, leaving the engraved designs to the old treatment; and the Hindu gods and their incarnations may be seen circling round the unmistakable body of the British domestic teapot, to which is added an ordinary spout, and a cobra-entwined handle. "But," says the dealer, "the sahibs or mem-sahibs (ladies) like it so, and we sell to these." The old forms still remain, and are to be obtained if wanted, for there is yet some local demand for them. Many will consider that the brass harmonises better with the copper basis than the bright overlaid silver now in vogue, in which the contrast is at first rather staring. But when mellow, there is no fault to be found with this production, if the shape of the vase of Tanjore work is good. Some of the most beautiful of the "*purána chiz*" collected at Benares were of this class—the overlaid patterns sometimes geometrical, often of graceful tracery, with the deities excellently modelled. The Hindu, as already explained, prefers the copper and brass combination—the one metal representing the sacred Ganges, the other the Jumna, and of this style was all the old work.

Of good copper vessels there is much that is artistic still to be found in India, and the melon-shaped water vessels of graceful design have already been noticed. The platters are occasionally well engraved with carefully executed tracery, and are sometimes fluted. Being mostly used by Muhammadans, there is an absence of graven images. The reddish copper ware of Cashmere, resembling old gold, is very handsome, and the shapes and designs, unless demoralised by European models, are often excellent, the *serais* and water vases being effective for decoration.

MORABAD WARE also has come much into vogue among European purchasers, and has often great merit. In that part of India there is a large Muhammadan population, and this metal ware supplied the tastes of the richer classes. The ornamentation is thus confined to tracery, figures and deities finding thereon no place. The material is brass; the pattern is graved. The brass body is then tinned, so that the substance resembles silver. The graving is then filled in with a black or coloured enamel, and the effect is excellent. It somewhat resembles the Bidri work (also a Muhammadan industry), save that the colours are reversed, the basis in the latter case

being black, the ornamentation, silver, standing out white.

Bidree Work (a composition of copper, lead, and tin, made black, and resembling iron) is of a finer and more expensive character. The best specimens come from Hyderabad, Deccan, where a rich Muhammadan court has long supported the industry. It is to be met with in the shapes, and vessels which are used by well-to-do persons, and some excellent examples of hookah-stands and the like can be purchased. For the reasons mentioned above, the work is generally confined to tracery—the basis being dark, the pattern graven or eaten out by acid, and then filled in with silver. A small vase for Ganges water (picked up in the Benares bazaar), exquisitely ornamented with flower scrolls and figures of the deities, is the only Hindu specimen that has come into my possession. But possibly others exist, although they can hardly be common. As the European demand for this ware is limited, the shapes have not yet been injuriously affected by so-called civilised taste.

At Lucknow (which also possessed, until the annexation, a luxurious Muhammadan court) there still exists a metal industry which may have been an imitation of Bidri ware—iron vessels ornamented with silver, the silver being overlaid, as in the Tanjore ware, instead of inlaid, as with Bidri. The designs, also Muhammadan in treatment, are bold, though, from the nature of the work, lacking the delicacy of the superior Deccan art.

The most beautiful of all the brass work comes from outside India—from Nepal, the independent State in the Himalayas to the north-east. Here a wealthy native court still survives to encourage and support its artificers, and the country is far removed from European influences. Sacred places abound, attracting many pilgrims, and the many vessels for ritual, or ornament, or use, retain their purely Eastern character, whilst many beautiful designs have been handed down for generations, and are adhered to with conservative tenacity. The vessels are generally cast, and then tooled, and often exhibit a luxury of detail in divinities, tracery, garlands intertwined with the sacred serpent, and the snake is also invariably combined with the tree in the beautiful shrine-backs, a speciality of Nepal. The sacred lamps, placed on the floors of the temples or hung from the roofs, and used as *arthis* in ritual, are of special excellence, and are occasionally to be met with at Benares, where they have probably been left by some Nepalese devotee, or brought away by some pilgrim from the Ganges valley. Nepal, as yet, has not been opened out to the tourist, whilst our own officials are limited to the British Resident and his staff. The country, as yet, has hardly been laid open to contribution for art metal ware, though Colonel Sir Edward Durand, a former Resident, has been fortunate in making a fine collection of some of the best work, specimens of which have already been figured in this journal, and another of which will find a place later on.

The above sketch has no pretence to be a detailed survey of the storehouses of Indian work in the baser metals. As has already been mentioned, the industry flourishes in every town and Province, and so supplies local wants; and Nagpur and Poonah will contain not only all the ordinary specimens of this kind, but occasionally treasures made by an enthusiastic worker for a rich patron, as well also as far-away Assam, or the better known Benares of the tourist. The best preserved survival will, however, always be in the neighbourhood of courts, and there is no State in Central India, or elsewhere, which cannot produce excellent workmen, and excellent specimens in brass and in copper, entirely Indian in their treatment, as made for the local—not the foreign demand.

Leaving the baser metals, and coming to the workers in silver, gold, and precious stones, the same remark applies. But a silver hookah and the like are luxuries, for which the demand must depend on the wealth of the community. The tendency of British rule is to level down, so that whilst, save in times of exceptional severity, the lower classes are better off, with greater security, and an immense development of trade to assist them, the rich, luxurious—often idle—class, the supporters of art industries, is disappearing, save in Native States. In British territory, the court favourites, male and female (the patrons of the goldsmith and jeweller, and of the workers in valuable tissues) are nearly extinct, or have little money left for such vanities. The trader, or *bunniah*, whom our rule is enriching, has not yet fully developed a taste for such articles, and the trade perforce languishes. Many of the artificers and their descendants are turning to more remunerative employ, often to the railway workshops, where the Indian craftsman—in patience, in temper, and in delicacy of execution—is found to be almost without an equal. As will be explained in greater detail in the second part of this paper, the poorer classes carry their spare cash on their persons in the shape of silver ornaments, regarding these as investments. The trader requires much of his capital to turn over in his business, and perhaps invests occasionally in Government paper, occasionally in trinkets. There is thus a steady demand, in average times, on the worker in the precious metals. The women exert a powerful influence, and their thoughts, with little else to distract them, often turn to jewellery and finery. Besides being an investment, trinkets are the appanage of a self-respecting establishment, and the well-to-do man's wife and children must possess a decent outfit. As a man's means increase, there is a steady progression from the plain silver bangle to elaborate ornaments in the same metal; then to gold trinkets in endless variety; and eventually to precious stones; the process being inverted as hard times, or the expenses of a marriage affect the financial position of the investor. But it is a long cry to domestic vessels of the more valuable metals. A man must indeed be rich to command the silversmith's or goldsmith's aid for ornaments other than those he can carry on his person, or with which to adorn his family. At the courts, and among the rich mercantile classes, silver hookahs, boxes for betel nut, and the like, will be found. And the Maharajahs and chiefs and exceptionally wealthy individuals may think that gold, or gold encrusted with jewels, is necessary for their magnificence. But such cases are comparatively rare, and the commissions to the craftsman must be comparatively limited, and such articles seldom appear in the market.

The European collector will have his taste satisfied for silver goods by the Cutch work, by the products of Cashmere, where *serais* and other water vessels, besides the copper specimens already mentioned, are reproduced in silver, sometimes ornamented with gold, the patterns being well executed and tasteful. The Lucknow dealers, too, have developed the industry of later years, and do a large business with travellers and residents. But of this class of work the Burmese silver is deservedly the most celebrated, and is the boldest and most meritorious in execution. But it is expensive, and this new Province is beyond the range of the ordinary tourist, and visitors are few, and the demand is chiefly limited to purchasers on the spot, who can ensure careful workmanship. A really good Burmese silver bowl is a delight. The cunning Lucknow workers have learnt to take casts of such

bowls; these are subsequently "tooled," and the result is fairly satisfactory, though below the original in merit.

So far jewellery, in which silver and gold ornaments for personal adornment are included, as well as those set with precious stones, has not come under notice. This, with the variety and taste and excellent workmanship of the specimens seen all over India, in its many countries and among its many peoples, is rather a vast subject. Still it may fairly be included under metal work, and an attempt will be made to touch on it in a later paper, with which it is hoped the jewelled articles brought home by the great Lord Clive, and now in the collection of the Earl of Powis, may be shewn in the beautiful photographs taken by Mr. Griggs.

The illustrations which accompany this issue of the journal, and which have suggested a rambling chat on Indian metal work, founded on the remembrance of pleasant days passed in examining and collecting specimens, now call for brief notice. It will be understood that the plates are not intended to illustrate the text, and that the foregoing remarks have little reference to them. The photographs are themselves of high merit, and accurately and in minute detail reproduce the forms and the workmanship of the various exhibits. The articles represented have been taken from the loan collections already noticed, but as to the manner of their selection, no information is available to me. It would have been satisfactory to see all these collections as exhibited; to have obtained permission to select examples of special merit in form or workmanship, and so to have arranged them in order as to illustrate and emphasize the best class of work of the several Provinces. But the collections have been returned, the Exhibition is closed, and there is no hope of any such arrangement being possible. The remarks in the earlier part of this paper may indicate that the specimens are in several cases such as would hardly have been selected by me as specially meritorious from my own point of view of excellence. But some of them represent what is now largely made, and for which there would appear to be a good market, which must ever influence the producer. And if the designs and shapes are not what will commend themselves to some, the details often evince taste, care, and distinct merit; and for any unsatisfactory result the influence of European "improvement" is unmistakably responsible. Still there are some pieces which exhibit the true native idea and treatment, pure and undefiled. The others have their claim to reproduction and notice, as assisting in teaching the lesson of what may with advantage be avoided.

Taking first, Plate 65, the not unfamiliar form of the British race-cup, or loving-cup, with its handles, may possibly be recognised. It was probably new to the native craftsman, who has gone somewhat wrong in the proportions of the body of the vessel to its accompaniments. The miniature elephant on the lid is playing havoc in a vineyard, amidst proportionately colossal grapes, which are evidently intended to indicate the festive purposes for which the cup is designated. Leaving the lid and coming to the body of the work, the native deities, the tracery and the panelling are quite the workman's own, shewing good finish, and are probably the reproduction of ideas with which he has often ornamented vessels of quite a different type. With the base he is more at home. If it is rather large for the rest of the work, the designer was probably at fault. The pedestal might have served for a lamp or some such ornament, and the details are all good. "But the Sahib would have the shape thus." And the Sahib is the master, and provides the solid rupees as the material, and pays in silver a quarter, or even more than that, of the weight of the vase to the silversmith for his work. The owner must have been evidently quite satisfied; and, after all, it may be one's own taste that is at fault—not the designer's. The cup was, I learn, made in Cutch.

Plate 66 is a much happier adaptation of what appears to be Cutch silver work in good relief; the details of the vase, as the photograph clearly shews, being excellent in design and in finish. Here the handles, of elephants' heads, are elaborate and well modelled, instead of the bare additions to the elaborately ornamented vases shewn in Plates 65 and 70. This is apparently part of a handsome table-service, and is after the manner of the old wine-coolers, now used as flower vases for decoration.

In Plate 67 a good class of work is produced on a silver box of Indian form, inasmuch as it follows the lines of the gourd, which, before metal was to hand, served for vessels of many sorts, as did the buds and flowers for the ornaments which have since largely been adopted for personal adornment in every class of metal, and with pearls, and precious stones. The manner in which the pattern on the lid changes not too abruptly from that on the body, the general character being still preserved, is happy. Dainty boxes, used to hold betel leaves, areca nut, and lime, are common among the better classes, and give an occasional chance to the gold or silver smith of exhibiting his skill. These do not often come into the market; for, be it understood, few articles are made, save in tourist centres, to suit the popular taste, or exposed in shop windows on the chance of sale. The silversmith, and even the goldsmith, is not a capitalist, but a worker for daily wage, and has no spare rupees—either to provide the metal basis, or to invest in speculation on the chance of sale of his goods. He is supplied with the coins, which are melted down and then hammered into shape, and the payment for the work depends chiefly on the bazaar estimate of his ability, multiplied by the number of hours or days spent on the work.

The vase of hammered silver (Plate 68), excellent in workmanship, with flowered scrolls and graceful panels all finished to a nicety, but bold withal in pattern, is of the shape of some of the old-fashioned water vases of the Benares bazaar, and so commends itself to an old collector of metal ware. The work appears to be that of Cutch, but enough has been said to indicate the view that the silversmith in many parts of India can produce good work.

The bold, carefully hammered work of the silver vase of Plate 69 stands out in every detail in this splendid photograph. The shape appears to be partly borrowed from the *serai*, which, however, has not been followed in the neck and top. But the workmanship is of high class. And then the *serai* is intended to hold water: this much more ambitious vessel, with its vines and grapes, is evidently designed for wine, so that a different treatment was demanded.

In Plate 70 there is evidence of Indian art "improved" upon by European influence. The lines of the vase follows partially those of the *lotah*, the true form being shewn in the examples in Plate 76. These have been left when approaching the neck. The addition of handles, and a flat with a group of figures, endows the whole effort with a character of its own. It may be the original design of a native craftsman, whose ideas have got rather mixed after a study of European models. Whether the result is considered satisfactory or not, must

depend on individual taste. But it may fairly be advanced that this is not an example of the original ancient Indian idea of form. The details of the work on the body of the vase include popular scenes from the Hindu pantheon, in panels, with graceful floral scrolls all in relief of characteristic Indian work. But coming to the group on the lid, here the artist has got out of his depth in attempting something to which he has not been accustomed. Krishna, with his flute, is surrounded by the milkmaids. All the figures are stiff and wooden, and the whole effect can hardly be considered pleasing.

On Plate 71 is figured a silver *serai*, or water vessel, of delicate Cashmere ware. It will be noticed that this lacks the boldness of the hammered scroll work of the Cutch vase on Plate 66 and others. The handles are new to me, and the design may be more or less Persian, and differs from that of the ordinary graceful Indian earthen *serai* turned on the wheel, the stem of which is narrow at the base, swells at the centre, contracting again towards the top. The flower work and arabesques follow the lines of Muhammadan architectural ornamentation.

Plate 72 contains two specimens of Indian art, pure and simple. They are the rose-water bottles, out of which scent is served on ceremonial visits. That on the right may be considered stiff and severe in form, but it is entirely of the country. The design of the other is much more ambitious, and clever. The central flower is somewhat conventional, but the stem, base and top are graceful, and the birds are happily introduced, so as to break the line. They may be parrots, or not improbably intended for the popular "*chakwi-chakwas*," the fond pair, doomed to separation, who call to one another plaintively through the night, from either side of the river or valley, in the tones from which they have their name.

Plate 73 shews a large spectacled brass cobra, erect, of the shape familiar from the Benares and other Sivite temples. The lower part is evidently intended to be placed around the *lingam* of this worship. The snake is represented with seven lesser heads, which number is generally found in the snake canopy surmounting the deity. The specimen has apparently been cast, and has not had much care bestowed upon it by a practised metal-worker.

Plate 74 (from the collection of Lieut.-Colonel Sir Edward Durand, Bart., C.B.). The columnal lamp-stand, cast in brass, is from Nepal, and is one of the class to which allusion has been made in the account of our Benares successes. A simple holder, of the shape of the vestal lamp, is placed on the top, the wick hanging out as a tongue. These lamps are used in the temples and in private houses, and are placed on the floor, the light being supplemented by hanging lamps of quaint and graceful design, which may occasionally be seen successfully utilised for electric light in London houses, as a relief to the conventional forms to which one is generally condemned by the electric fitter. The shape and proportions are as satisfactory as all the details, which, step by step, are carried out in pleasing variety. The design follows, to some extent, the form and pattern of the wood-carving, which is of high excellence.

The platter on Plate 75 is another specimen of Tanjore work, similar to that on the *lotahs* above described. There are few articles of this class of Indian metal ware more effective, the contrast of the two colours used shewing out well. The floral leaves and scrolls in the concentric circles surround a central plaque, on which Krishna is represented playing on the flute, with the sacred bull behind him. The work is in relief as in the other specimens, with the second metal overlaid.

The small vase, also included in the plate, has this to be said against it—that the snakes or cobras supporting the bowl have reason to complain of the manner in which they have been shorn of their proportions. The "idea" appears to have been taken from the dolphin of our sea-girt kingdom, occasionally used in British vases, cobras taking their place here as being better adapted to a cup ornamented with Eastern scrolls. Even the comparatively sturdy dolphins appear under difficulties, and at a disadvantage in such acrobatic postures. In the case of snakes, which are long and slim, the difficulties are proportionately increased. This seems to have been partly met by snipping each snake down to the length of a corpulent earth-worm, with whom no self-respecting cobra would admit the most distant connection.

In Plate 76 European and Indian forms are shewn side by side; whether intentionally or not, for contrast, cannot for certain be advanced. But the shapes of the two upper examples will be recognised as those of the familiar tumbler and finger bowl. Below, in the centre, is a reproduction of a chalice or cup, flanked on either side by the Indian *lotah*. The work in each case appears good. It may not unfairly be said that a bowl is a bowl all the world over, and that the shape, whether that of the finger-glass or the flower-vase, is simple and not open to objection. As for the chalice, it has evidently been copied from an European original, or sketch, though it seems doubtful whether the proportions have been carefully observed. Given a pattern, not a sketch, a clever native workman will copy anything exactly; even as a native *darzi*, or tailor, if given a coat to copy, will faithfully reproduce it—even to obvious defects in buttons, or a patch, or the like. Coming to the *lotahs*, we have good specimens of real Indian work which will commend themselves to the taste of those who prefer it to those patterns affected by European influences. These are both Tanjore work of copper overlaid with brass, the figures and floral pattern being hammered out in relief—the second metal being sometimes brass, sometimes silver, overlaid, and then tooled and finished. They are specimens of the Gunga-jumni *lotahs*, the discovery of which among the "*purána chiz*" of the Benares bazaar was as a joy to us. On the one to the left, it will be seen, members of the Hindu pantheon appear between panels surmounted by floral scrolls. The effect on the other of the flowers in bright metal on the dark copper is always excellent. The borders above and below are similarly treated with alternate copper and brass, or silver tongues, leaves, or scrolls.

Plates 77 and 78 exhibit respectively a Burmese silver bowl, and one of the class which, of recent years, has been produced by the silversmiths of the Lucknow bazaar. It may appear somewhat unfair to place them side by side, as the one costs, weight for weight, perhaps three times as much as the other. If you give the Oudh man 100 rupees, he will put all the silver into the bowl, and ask 25 rupees for his work on the finished article. The Burman knows that his is much superior work, in much higher relief, and is of much better design, and requires much more time and care, so fairly enough he charges proportionately. The figures on the Burmese bowl appear to represent the "*Pui*," or masked dance of Burmah, or the figures may be some of the thirty-seven "*Nats*," or Burmese royal ghosts, treated of recently by Colonel Temple, C.I.E., in a former number of this journal. The

photograph, though good, does not shew the figures sufficiently clearly to admit of ready identification. The Lucknow workman has taken the jungle for his subject, and has represented men, birds, beasts, and trees in much variety. The Lucknow craftsman is, as already noticed, beginning to adopt Burmese models, with the assistance of moulds. Since this was written, it has been suggested to me that both bowls are from Burmah. Of this I am doubtful: but if they are, one is of much better work than the other.

Plate 79, with which the series of illustrations concludes, is a specimen of work not Indian, but Persian,—a grotesque peacock elaborately fabricked in thin brass, of a delicate filigree class of work familiar to most collectors. The result is effective in its way, and well befits an Oriental room. But this bird seems too proud to associate with the more modest forms of Indian workmanship previously included, and for this reason, probably, has been commissioned to bring up the rear, all by himself. Since this was written, I have been informed that the work is Indian, from a Persian design.

It is proposed to include, in the next paper, some examples of strictly Indian art of old date, from the collection of the Earl of Powis. In bringing this instalment to a close, it may fairly be noticed that these notes have been written under the disadvantage of absence from one's books, so that one has only an imperfect memory on which to rely for one's remarks. And any attempt to transport one's self back to India, and its wares and surroundings, is difficult, when one writes amid the deep snow of the high Alps, with the thermometer well below zero, in contrast to the warm and muggy atmosphere of the Benares bazaar.

Grindelwald, Switzerland, March 1901. J. H. RIVETT-CARNAC.

LIST OF ILLUSTRATIONS.

15 PLATES OF METAL WORK.

Nos. 65, 66, 67, 68, 69. Cutch. 70. Jeypore. 71. Cashmere. 72, 73, 74. Southern India. 75, 76. Madras and Burma. 77, 78. Burma. 79. Indian reproduction from a Persian original.

65.—Cutch Silver Ware.

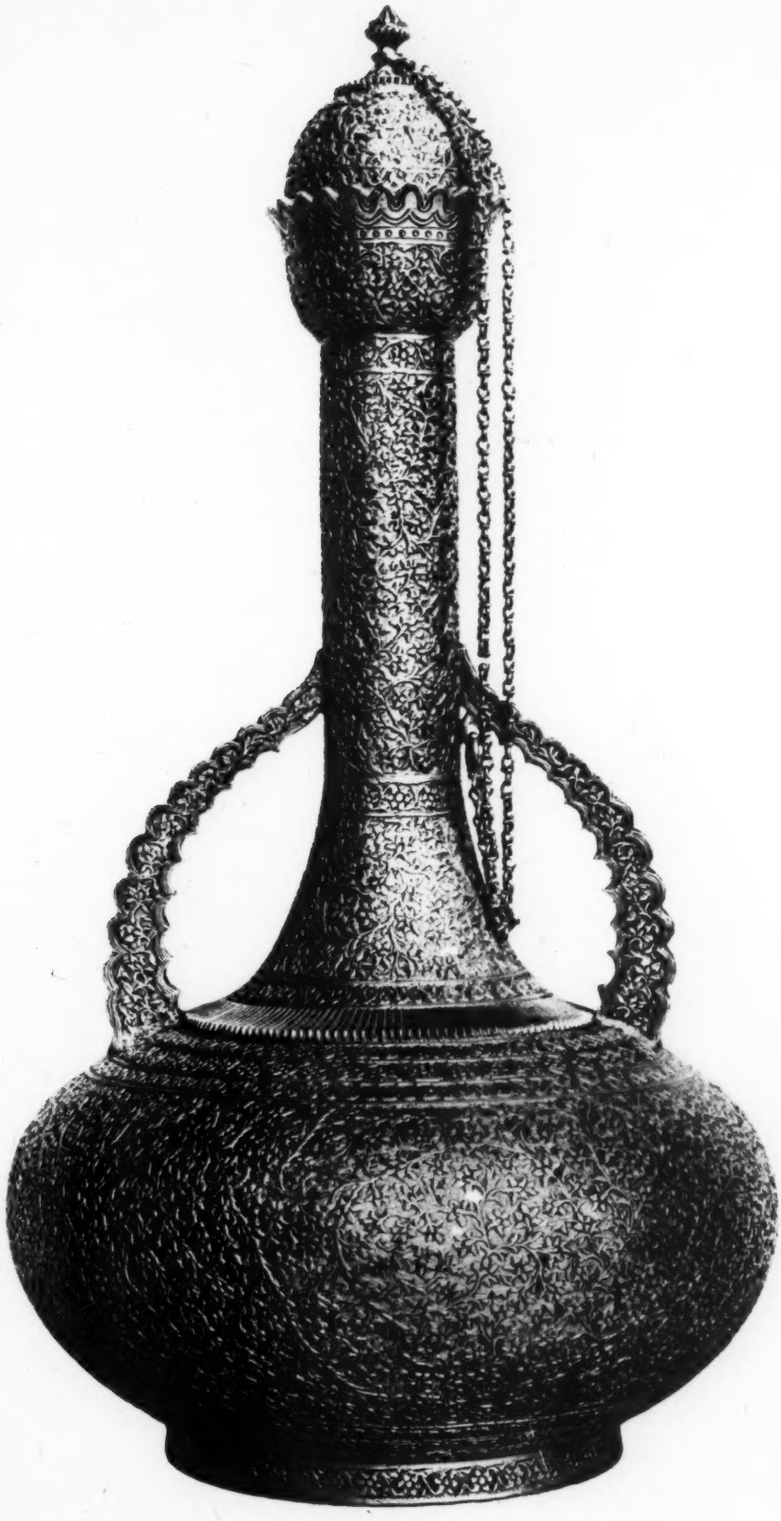
66.—Cutch Silver Ware.

67.—Cutch Silver Ware.

68.—Cutch Silver Ware.

69.—Cutch Silver Ware.

70.—Brass Work, Jeypore.



71.—Metal Work, Cashmere.

72.—Metal Work, Southern India.

73.—Metal Work, Southern India.

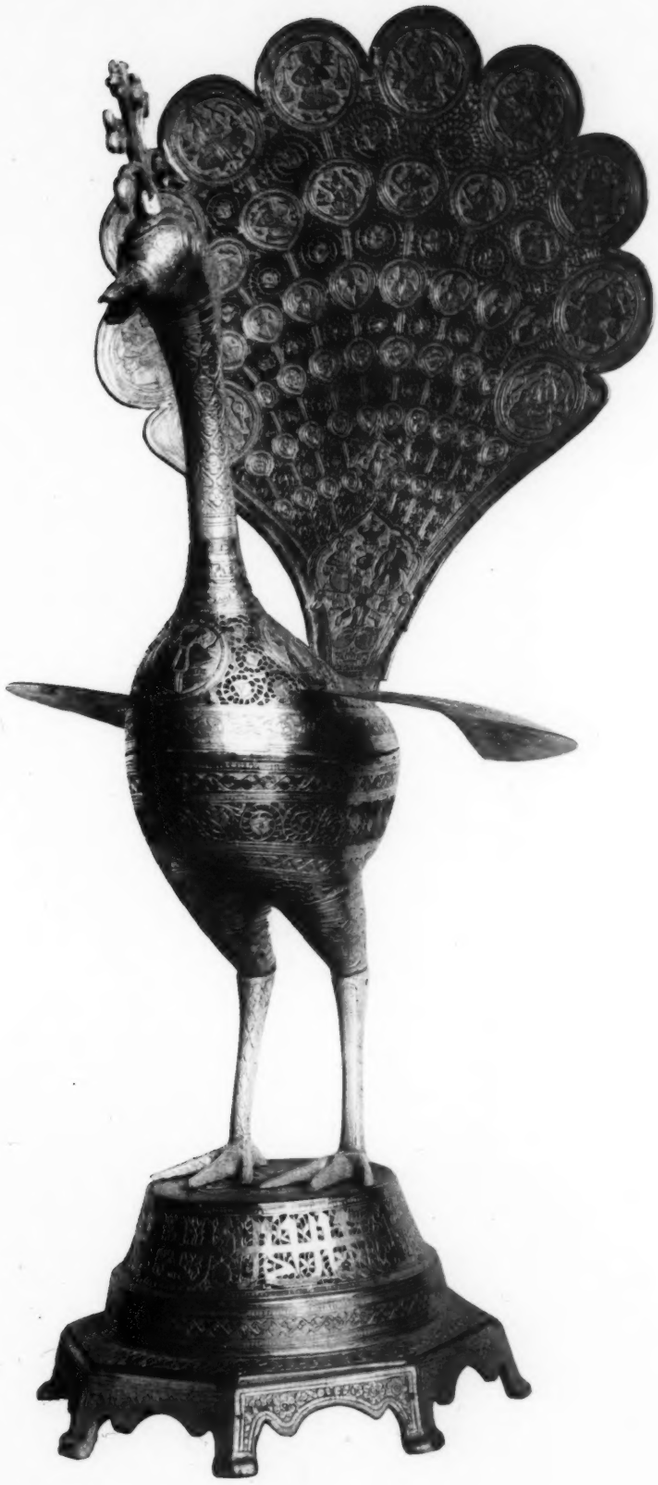
74.—Metal Work, Madras.

75.—Metal Work, Madras.

76.—Metal Work, Madras and Burma.

77.—Silver Work, Burma.

78.—Silver Work, Burma.



79.—Indian reproduction from a Persian original.

The Journal of Indian Art and Industry.

IVORY CARVING IN THE NORTH-WEST PROVINCES AND OUDH.

By L. M. STUBBS, Esq., I.C.S,

TO commence with an apology is to disarm criticism, though to follow this with an excuse is not calculated to create sympathy. At the same time, though the word ivory seems in many ways to possess peculiarly Indian associations, and ivory carving brings to memory Colonel Newcome's chessmen, this report is circumscribed by the geographical limits of the title.

The South Kensington collection possesses some most beautiful specimens of ivory work of various kinds, ranging from chessmen to inlaid furniture, but the closest survey will not reveal a single product of the North-Western Provinces, though the chessmen and carved divinities come from such widely distant places as Berhampur and Amritsar and the inlay work from Bombay and Vizagapatam.

The British Museum is no more productive, the art hand-books ignore these provinces, and, in short, anything in the way of extraneous information is very conspicuous by its absence. This is the more extraordinary when one comes to consider that within the scope of this monograph come such ancient seats of civilization as Agra, Lucknow and Benares.

The ivory carving of Northern India is sufficiently well known, probably more so in England than in India; but the places of sale for this work are, if not perhaps always the places of manufacture, at any rate ordinarily considered such. Amritsar, Delhi, Murshidabad and Berhampur are perhaps the best known places for the purchase of ivory carving, and very beautiful work may be obtained there; the specimens of Berhampur work in the South Kensington Museum being probably the highest degree of perfection to which the art has attained,—two pieces in particular, a set of chessmen and a group of Hindu divinities.

Indian ivory, says the *Encyclopædia Britannica*, is not so well adapted for carving and turning purposes as is African or even the fossil Siberian, for various technical reasons into which it is not worth while to enter; but at the same time these specimens show to what a height the art might reach were it to receive due encouragement and a moderate amount of education; the former being much the more important condition, as anyone who has seen anything of the progress of Indian arts in various departments can readily understand.

Turning to the inquiry in these provinces, anyone who has had anything to do with a monograph of this kind will appreciate the difficulties of acquiring information when the subject is not a familiar one and such information as ought to be obtained is not ready to hand. Owing to the instructions received from Government the ordinary course was not followed; no circular with questions was sent out, and only likely districts were communicated with. The result of such inquiries may be imagined, and from district after district the same answer was received, most discouraging in its curt finality. The cause of this is, however, easily discoverable: the Deputy Collector or Tahsíldár found it difficult to connect the two ideas of the monograph and the ivory, and in many cases discovered the wrong word in the dictionary. However, the net result of such inquiries at the beginning was the conclusion that ivory carving was not an industry extensively followed in the North-Western Provinces, and this was not shaken by subsequent investigation.

This plan having been found unprofitable, personal inquiries yielded rather more result; but here too it was necessary to face a certain amount of difficulty. Such ivory workers as there are, are not men of means nor intelligence; and they are convinced, despite assurances, that no good can come of such paternal Government. Moreover, as will be seen from what follows, with the best will in the world they could tell but little since there is so little to tell.

This being so, it follows that such information as is contained in this paper is mainly derived from personal inquiries: and it would be as well to begin by saying that though reluctantly compelled to differ from so many Collectors and Deputy Commissioners, I am still of the opinion that there is ivory carving in these provinces, and that it is capable of development.

Furthermore, in the teeth of denials, it is difficult to say definitely that the art or industry flourishes in any given place; but it is my opinion, submitted with due deference, that the facts I have elicited are typical, and that to a limited extent, the art of ivory carving is practised and may be discovered in the bazár of every considerable town in the provinces, and that in places where it does not exist it could easily be created and fostered.

In some towns—Lucknow certainly, and I am inclined to think Benares and Agra—one can say more than this; and there are skilled workmen with definite traditions and real capabilities only limited by the paucity of demand, and kept in obscurity because the market for the higher class of their wares is foreign and, as a rule, reached through the middleman; that is to say, they are better than they themselves know and lose what chances they might have through lack of ambition and an ignorance of that glory of civilization—self-advertisement.

If, then, we may take Cawnpore as a typical instance of a place where ivory carving is followed to an extent created by the ordinary demand, that extent will be found to be very limited indeed. In the Cawnpore bazár there are two or three small shopkeepers who earn a presumably precarious livelihood by the manufacture of bone instruments for the pen-boxes of the clerk or for the toilette boxes of the Hindu lady. (*Kalamdans* and *surmadanis*, together with the small pencils for the application of *surma*). They also make such small articles as paper-knives, combs, chessmen, and various articles in the ivory or bone fretwork which is so easily obtainable.

These men, as I have said, are merely bazár workers with no ambition beyond the earning of the necessary 4 annas a day, and as a rule, do not work in ivory unless they have a definite order to justify the outlay. The ordinary purchaser is quite content with his articles if they are made of bone, and in Cawnpore, as a matter of fact, I was told that the only customers for ivory work are the European residents. In proof of this I was shown a billiard ball and a chess pawn, neither in any way strikingly original in conception or execution, as may be imagined from the nature of the subject, the latter being only the most conventional form of an object which presents always—and in other instances shows—very great possibilities. In spite, therefore, of professions of ability to execute any commissions that might be given, judging from the specimens produced, I gathered that the performance would fall short of the promise. The bone articles were of the usual kind, and such as are easily obtainable in any bazár.

I was informed that there was no regular supply of ivory as there was no regular demand, but that it might be obtained in the bazár with a little difficulty at prices varying from 3 to 7 rupees a seer. As to original sources of supply, my informant was exceedingly vague, but seemed to regard the Commissariat Office as being a likely finding place. It goes without saying that these people have no stock and no ivory in the raw; their usual trade is in bone articles, but they are prepared to work in ivory if they are supplied with an order, and would prefer to be supplied also with the material. They could not give me any information as to the places where I should be most likely to find a flourishing trade in ivory, but grasped at Lucknow as being a likely enough suggestion. As I have said, I take Cawnpore to be a typical instance: no stock, moderate skill, but infinite willingness to satisfy any requirements. Not much to go upon, but still the indispensable foundations of an industry, even if only the bare necessaries.

As to the origin and history of such art as there was, I could gather no information at all. My informant's father and grandfather had done this work; had always done it, since the memory of man. There were no models, no drawings; such things as were made, were made so because they agreed with a traditional pattern stored in the head of the maker; they had always been made so, how should they be made otherwise? The men I interviewed were Mussalmans, but the craft is apparently permissible to the Hindu; or my informant was ignorant of any prohibitive reason, though the inconvenience of bovine sanctity would necessarily limit the scope of their endeavours in bone.

Turning to Lucknow, I received through the Director of Land Records a list of articles made in ivory by people in Lucknow; small articles, for which there should be an immediate and moderately constant demand. The following is the list:—Combs, small toys, requisites for *kalamdans*, articles for applying *surma*, &c.; chessmen, card-cases, small models of buildings such as the Taj, paper-knives, paper-weights, handles for sticks, &c.; small boxes, and scissors. I interviewed the man who made these things, and the results of the interview seem to be really all that can be described as worth knowing about the industry in our provinces. The man was, as usual, only a small dealer with no stock; his chief boast being that he was the Government contractor for the supply of instruments for vaccination. He assured me that his entire stock consisted of a box a foot square containing small articles in bone and ivory, of which the most elaborate was a walking-stick handle. This was priced at ₹15, and was a realistic if somewhat archaic representation of a tiger devouring a black buck. This was distinctly the highest flight in art which I had seen and really possessed some merit. The rest of the stock in trade were the ordinary things—small knives, paper-knives, &c., made in the usual fretwork style, usually of bone, the most elaborate being the conventional woodpecker pattern in a paper-knife. He assured me that he worked by no pattern, but according to traditional ideas; that the only tools he employed were a knife and a file; and that the fish, tiger's head and birds with which his work was adorned were partly his ideas of nature and partly those which his father had copied before him. His ivory came from Bombay or Behar, or wherever he could buy it most cheaply, the price varying according to quality from 6 to 10 rupees a seer. Apart from his Government contract and occasional orders, his chief employers were middlemen, who sold his work in Delhi and elsewhere, and he could undertake any commission.

He volunteered to make me for ₹100 a complete set of chessmen in red and white, of the most elaborate description, with camels and elephants, and the kings sitting upon their thrones. Taking this into consideration, I am inclined to think, in spite of the Lucknow Museum authorities, who profess ignorance on the subject, that the really beautiful set now in the museum may come from the Lucknow workshops; and to support this theory, I am glad to be able to quote the opinion of Mr. Yusuf Ali, C.S., who purchased a similar set in Lucknow. This I have not been able to see, as he had parted with it; and owing to my having to leave India I have not been able to get a similar set made. This, however, is the description he gives of the set made for him, which corresponds very closely with that in the Lucknow Museum:—"Eight pawns about an inch long, dressed according to the carver's idea of old Indian infantry uniform, with shield on one arm and a lance poised in an angular direction in the other (to show the pawn's angular motion when it takes a piece); king sitting on a throne about an inch square; vizier with a stately beard on a somewhat lower 'masnad' than the king; two camel sowars (bishops); two cavalry sowars (knights); two elephant sowars (castles); one set white and the other red (*minakári*) work. Cost ₹40." Mr. Yusuf Ali is inclined to believe that they make these sets also in Benares. I think it is very probable, though I have been unable to get any information on the subject. Judging from the price that Mr. Yusuf Ali paid, I should be inclined to think that his set was made in bone and not in ivory, but the result is much the same.

The ordinary chessmen are, of course, much more modest in appearance and frequently merely shapeless lumps; but these facts tend to show that there is artistic capacity amongst the ivory workers which only needs encouragement and advertisement to be developed into work that is really worth study and inquiry. Moreover, I think there can be little doubt that this industry is not confined to Lucknow, but flourishes to about the same extent in Agra and Benares. Certainly I was told so by the Lucknow ivory worker, though from official sources the answer extracted was in the negative.

My informant told me that his father and grandfather had lived in Lucknow and had always carried on their craft; that they had their own traditional patterns, and that though they generally worked in bone, they were glad enough to take to ivory if they were given the opportunity; that they did a fair trade, though they paid no tax and had no stock. He professed his ability to carve any figure, human or divine, though as portraiture did not come within his scope, the result must be mainly conventional. As to methods of manufacture, he could or would give me little or no information. As I have said, he stated that his tools were a knife and a file; that he used no machine, and attached much importance apparently to the process of polishing, for which, however, he had no special recipe. His orders for ivory work, of course, came mostly from the *Sahib log*, whether directly or indirectly—mostly the latter, as he worked without any ambition or any desire for personal notoriety.

This, then, is the picture of the state of the ivory carving industry in its most favourable aspect. Skilled workmanship on good models, only wanting encouragement from purchasers—and that not in the direction of education, but merely in demand. It is unfortunate that there should be so few connoisseurs in native art in our provinces, and that a busy official life should necessitate neglect of such things, leaving the necessary patronage to the ignorant, if greedy, globe-trotter; but this is probably inevitable, and even in this direction I am convinced that something might be done for the industry, were it a little better known.

In Benares, I was told by the native artists, there is carving carried on to a similar extent and of a like kind, but through official channels I learned that such as there is, or was, is derived from a workman imported in the last generation by the late Mahárája from Murshidabad. This would, of course, be carving of the Berhampur school. This man is dead and has left no successor; and though specimens of his workmanship and traces of his influence may be found, he worked only for the Mahárája, and was his servant and not an independent tradesman. This is, of course, an exceptional case of the fostering of a foreign art by patronage: but I am inclined to believe, relying on native and trade information, as likely to be fully as accurate as that derived from official sources, that the industry flourishes in Benares to much the same extent as in Lucknow, and that the Benares workmen, like those of Lucknow, find their market through the middlemen from Delhi and elsewhere.

The same remark exactly replies to Agra, where moreover may be found models of the Taj Mahal carved in ivory. I am officially informed that such models of the Taj as are sold in Agra are imported from Delhi, but this merely illustrates my point in another direction—namely, that the carvers in Agra work for the Delhi middlemen, who on occasion bring back these wares to the place of their origin, merely an illustration of what frequently occurs in England and elsewhere in other and humbler industries.

This is the result of the inquiry with regard to the industry in its main aspect, but there are, of course, offshoots and exceptional by-products of a less elaborate description; for instance, I learn through Mr. Moreland that there are obtainable in Mussoorie small carvings of animals in ivory, apparently of a very crude description and not unlike the small silver figures which come from Muttra. I had hoped to be able to get some information on the subject from Saháranpur, but beyond the ordinary rough inlay work, which is found in better quality in Nagina, I have not met with any success.

In Nagina, I learn from the tahsíldár, there is an appreciable industry in ivory, but not of a high order of art. He enumerates combs of the conventional kinds, small boxes, and knobs for walking-sticks, mostly in plain ivory, and says that for more elaborate articles and figures it is necessary to supply a model to copy.

On the other hand, ivory inlay work is carried on to a considerable extent, the ivory being set into ebony in floral patterns after the manner of the Agra marble inlay work. This is familiar enough, and though the better class of inlay work comes from Bombay, the ingeniously dovetailed ivory and ebony boxes may be also obtained here. The really fine work is mostly in perforated ivory of the ordinary kind obtainable in Lucknow, and is scarce, though combs are a speciality in Nagina. Chairs and teapoys are made in inlay work of the ordinary kind—ebony set with ivory in thin strips; but there is nothing elaborate in the patterns, which, though good enough in themselves, do not display anything strikingly original in design or conception. This is a separate branch of the ivory industry and can hardly be described as carving in any true sense of the word; but, such as it is, it is too well known to need description as to manner and style, and quite sufficiently familiar to be independent of advertisement in the ordinary way, though undoubtedly it is capable of expansion under encouragement. Ivory in the raw is a more familiar commodity in Bijnor than in most other places; but that this does not necessarily imply that there is any particular demand for it, is illustrated by Mr. Cockburn, Deputy Collector in Kumaun, who informs me that the Rája of Kashipur and the Deputy Commissioner of Almora, wishing to dispose of their stores of ivory, were unable to find a market in the North-Western Provinces and had to turn to Amritsar and the Punjab, where a demand for ivory always exists for the manufacture of ivory armlets for the women. One of the by-products of ivory is apparently ivory dust, which besides being used for polishing ivory carvings is also much esteemed as a medicinal preparation, which is believed to have an invigorating effect and is used as a tonic.

The price of ivory, according to Mr. Cockburn, varies more than seemed to be known to the Lucknow workmen, ranging from Rs. 2 to Rs. 20 a seer according to elasticity, size and tint. Mr. Cockburn's information is the more valuable in that he is himself an amateur, and I have learnt from him various details as to the tricks of the trade. The cheapest ivory is derived from young animals, and is brittle and of a yellow tint, so that it is of little use for carving purposes, the most valuable being, of course, tusks that have the greatest diameter and are of a white colour, such commanding a high price because the armlets above mentioned can be turned out in one piece. Ivory is preserved in India, as elsewhere, by being covered with a coating of melted wax, which prevents the loss of moisture.

It is unfortunate for the purposes of this monograph that so acute an observer as Mr. Cockburn should have been forced, by the barrenness of these provinces in this respect, to turn his attention to the products of Amritsar, but he confirms my impressions with regard to the industry generally in his remarks as to models. He quotes, as a familiar instance of ivory carving, the little model bullock carts which may be seen frequently at home, but these are not made in our provinces, even the carts themselves being of unfamiliar aspect. At the same time, he

says "Natives are strikingly conservative in their ideas of patterns as of other things, and their animals and figures, their inlaid boxes and perforated carvings, follow the same lines and repeat the old models which are familiar to us in wood, brass or stone." This is eminently true, and with the exception of the carved chessmen, the idea of which is not peculiar to the North-West, and is probably common to all parts of India, being as it is much the same in Amritsar, Berhampur and Bombay, and probably coming from some common model, I should say that ivory carving, in the North-West at any rate, has no peculiar models or ideas to distinguish it in any way from other branches of the carving industry.

To illustrate this remark, I would point out that the ivory inlay work, when it is anything more than ordinarily ambitious, is rather a repetition of the wire inlay or of the brass work of Moradabad; the animal figures are already familiar in brass or silver, and the perforated work may be seen in either silver or wood.

We may congratulate ourselves, at any rate, that so far our provinces in this direction have escaped the corrupting influence of European models, and in this we are more fortunate than the Punjáb, where they have begun to turn out combs and paper-knives in European patterns with Roman letters in quite the approved manner of Bellagio or Birmingham; and it is a melancholy prospect to think that in the fulness of time we may yet find sold on railway platforms paper-knives with the inscription—"A souvenir of Lucknow."

Mr. Cockburn tells me that Benares, Lucknow, Bareilly, Moradabad and Saháranpur have considerable industries in bone working, more particularly camel-bones, and that they are always ready to work rather in ivory, when they can get or afford it, because it is easier to work and does not require bleaching. This is again in accordance with my original surmise, but, so far as I have been able to ascertain, there is no distinctive product in any of these towns, and the same remarks apply to them as apply to Lucknow: their industry is latent rather than conspicuous, and their market is at Delhi and not in these provinces.

The native methods of workmanship are more crude than the European, though not less effectual; they use ivory dust rather than chalk for polishing, with ultimately the same result, and are apparently ignorant of the possibility of softening ivory with vinegar; but, judging from the ivory carving of India generally outside these provinces, we would gather that, on the whole, the Hindu craftsman has very little to learn to his advantage from the European, and it is to be feared that the introduction of improvements in method might mean a modification of patterns which would be anything but salutary.

To sum up the results of this inquiry, I think there can be no doubt that the industry does exist and is capable of development, or rather, perhaps, of expansion. As to its existence and present state, the skill in craft and the will to work are there, but these are crippled by the poverty of resources and the absence of demand. There is probably ivory enough in India itself, or easily obtainable from elsewhere, to satisfy an increased demand; but, on the other hand, when the demand is so small there is little or no encouragement to work without a definite order. The result of this is that the artists have little practice, and are unable to get more, because, possessing no stock, they cannot advertise it sufficiently to make it known to those who might become patrons. It is probable that were India to produce a great artist in metal, a Benvenuto Cellini, he would die unhonoured and unsung; and much more so would this be the case in ivory carving, which is an art which gives scope rather for ingenuity than genius.

Moreover, when art reaches the level of genius it gets beyond the scope of a monograph, and we have to look rather at ivory carving as an industry on a level with that of the silver workers of Lucknow. Looking at it from this point of view, any development is more practical, though perhaps less desirable. There is little or no native demand for ivory carving as there is little for silver work, and the market is generally found amongst Europeans. The difficulty, if it is desired to encourage the industry, is to advertise it sufficiently to these patrons, or to provide encouragement enough to the ivory carvers, or to give them sufficient capital to enable them to keep a stock of ivory for exhibition purposes.

There is not the least probability that there will ever be any great development of the industry in the provinces, nor any great increase of demand at Delhi, nor would much be gained if there were. Carvers in ivory are not a large class, nor would encouragement employ any great number of otherwise unemployed artists, and in any other direction it is doubtful whether education would be anything but disastrous.

European models are certainly to be avoided, and were the example of the Mahárája of Benares to be followed and an artist imported from Murshidabad or Berhampur, it is difficult to see quite what would be gained. The natural result would be that he would introduce his foreign method of carving and foreign patterns, which might or might not oust the original designs, but in any case would not blend with or modify them.

Moreover, all this speculation means the treatment of ivory carving as an industry, which of course it really is not and can never be; and the attempted encouragement of an art on industrial lines, though possible and practicable in such directions as carpet-making, can never be safely applied to anything like ivory carving, which is by its nature more analogous in kind to working in the precious metals or to the painting of pictures. Looking at the subject in this way, any advertisement of the art must be regarded rather as in the interest of the patron than of the artist; and from this point of view there can be no doubt that were the art better known in the North-Western Provinces, both patron and art would be the richer for work that is even at present good in itself and is perhaps capable of improvement to the point at which improvement in ivory carving must stop. This, however, is a question for the art critic and the connoisseur rather than for a provincial monograph, and opens up a very wide question indeed. As Indian art in other directions stands by itself apart, so also does ivory carving, which presents such opposite poles in possibilities as the mediæval carvings in the South Kensington Museum, the products of old France,[1] and the marvels of ingenuity which characterise the art of Japan. Indian ivory carving stands midway between the two, and the direction its development must take is Indian and must follow the lines of Amritsar or Berhampur. This being so, there can be little doubt that encouragement must be the result not of Governmental interference but of private patronage, which is driven by fashion and caprice rather

[1] Now being reproduced by W. Griggs.

than by judgment and sound appreciation; and would, it is to be feared, naturally turn first to the better known and more advanced products of Bengal or Kashmir, rather than be so original as to strike out an independent line for itself.

The natural channel of influence from Government would be by offering encouragement through museums of local industries, such as that at Lucknow, and it is possible that something may yet be done in this direction; though here again it is doubtful whether India is likely to be much influenced by a local exhibition, or her ancient arts modified with any very satisfactory result.

The conclusion may be a little depressing, but though little in the way of information has resulted from investigation, the object of the monograph will have been amply served if any interest has been aroused in the existence of an art which is at present apparently far too little recognised.

IVORY CARVING IN THE PUNJAB.

By T. P. ELLIS, Esq., Assistant Commissioner.

I.—Scope and Introductory.

The preparation of this monograph on the Ivory Industry in the Punjab has laboured under two disadvantages, viz., a lack of personal knowledge of the subject, and the difficulty experienced in obtaining anything but the very scantiest details of the work as carried on in the several districts of the Province.

The ivory industry falls under three heads:—I. Ivory carving proper; II. Inlaying; III. Turning. The first named is conducted only in two districts of the Province—Delhi and Amritsar, and in the Native State of Patiála. Inlaying, on the other hand, is in a flourishing condition in Hoshiárpur, and prevails to some extent in Dera Ismail Khan, and though returns are not available in the district reports received, there is little doubt it is carried on to a minor degree in every district in which there is a demand for decorative furniture, though in the majority of such districts the ordinary medium is of a different nature. Turning, which includes the manufacture of bracelets, *surmadánis* (small cells of varying shape and pattern used for holding the *surma* or antimony with which the women of the country are wont to darken their eyelashes), and billiard balls, finds a place in practically every town of any importance in the Province, at least so far as the making of *chúras* is concerned, and particularly in Lahore, Gujránwála, Dera Ismail Khan, Dera Gházi Khan, Mooltan, and Ludhiána. Though these branches of the trade are distinct, and the two last named cannot strictly be regarded as carving, I have taken the instructions received to imply that they should all be touched upon. The three industries themselves are, however, of such minor importance, proceed so much on the same lines wherever existing, and the information furnished has been so inadequate, that the material contained in the monograph must necessarily appear slight.

How very minute is the ivory industry in the Punjab may be gathered from the fact that Mr. Baden-Powell in his book on Punjab manufactures dismisses the subject in some four pages. At the time of his writing he states that the industry is conducted only in Delhi, Amritsar, Umballa, Ludhiána, Patiála and Lahore. If this was intended to apply to ivory carving proper alone, the list is too extensive for the facts of to-day; while if it was meant to include the allied industries of inlaying and turning, to those should be added the names of Dera Gházi Khan, Dera Ismail Khan, Gujrát, Gujránwála, Hoshiárpur and Mooltan.

II.—History of the Industry.

Ivory carving is probably one of the oldest of Indian arts, but of its existence in early history there are neither facts nor fables to prove much. In a country itself one of the world's suppliers of ivory and from time immemorial known for the skill and patience of its artists, it is not an unwarrantable assumption that the art was known and cultivated from early times. That work of a sort in ivory was practised in India prior to the Mussalman invasions is certain from the fact that the oldest specimen of chessmen contained in the South Kensington Museum is a set discovered nearly fifty years ago during some excavations on the site of the city of Brahminabad in Sind, which was destroyed by an earthquake early in the 8th century. The pieces are described as turned, plain in character, and without ornament. The chessmen and squares of the boards are black and white, alternate ivory and ebony, the pieces varying in height from one to two inches.

The history of the art so far as it concerns the Punjab is, however, of quite modern date. No early travels or descriptions of the Mughal Court that I have yet seen refer to the encouragement of this particular art; of its existence in Delhi in early times there are no traces, and tradition assigns to it no earlier date than last century. The family of Lála Faqír Chand, the present conductor of the works in the Dariba, appears to have commenced work some four generations ago, but the oldest specimen of work, that of an exquisitely carved Hindu pantheon, dates from only fifty or sixty years ago. (Since writing the above, I learn that the piece has at length found a purchaser). Since the establishment of the works in Delhi, they have been continuously carried on by the family which originally commenced them, and undoubtedly the best work that the Province is able to show is produced here.

In Hoshiárpur the inlaying trade is of ancient date, prior to the British Ráj, in which times it was patronized by the Nawábs and Rájas. Máháraja Ranjít Singh is credited with having employed the services of Hoshiárpur workmen in inlaying with ivory some of the woodwork of the Golden Temple at Amritsar, and other buildings in Lahore and different parts of his kingdom. But under native rule the number of workmen was limited. The Hoshiárpur trade has received a great stimulus under the British Government from Anglo-Indian residents and travellers, and one of the results has been large exportations to America, England and the Continent, where the work competes not unfavourably with the best work of China. Of late years the designs and specimens have

improved, and the numbers afforded employment have increased rapidly. Formerly inlaying was confined to small boxes used by natives, sticks, *chaukis*, *takhts*, shoes, and *chárpais*, while at present there is hardly an article of European furniture, tables, chairs, mirrors, easels, picture frames, photograph stands, sideboards, hat-racks, glove-boxes, &c., which is not used for decorative purposes. This departure is largely due to Mr. Coldstream, C.S., who displayed great interest in the encouragement of the work, and who is-understood to have contemplated the founding of a technical school, more in the hope of improving designs than of increasing the output or the number of the workers.

Patiála has been a centre of ivory carving for several generations, the late Máháraja being especially a munificent patron, keeping in his own employ an experienced workman, whose works, amongst other specimens in his collections, he exhibited at the various Exhibitions in Lahore and Calcutta.

The art of turning *chúras* or bangles must also be of considerable antiquity. In several districts the wearing of *chúras* of ivory is indispensable to women of both the Hindu and Mussalman faiths on the occasion of marriage festivities. In connection with this custom there is an interesting usage. No girl is supposed to wear such an ornament prior to her wedding-day, on which occasion it is the inviolable duty of the bride's *mámu* or maternal uncle to present her with one. Subsequently to the marriage, it is customary for the girl to lay aside her ivory *chúras* (in much the same way as the English bride disposes of her wedding garments), and to replace them with silver ones for common use. The custom is, however, not universal, and it is not uncommon in certain parts of the Province to see *chúras* being worn by other than brides.

It is unfortunate that the wearing of *chúras* is not as general as it formerly was, for, owing to the cheapness of silver and the facility afforded by the presence of the *sunár* in every bazaar, its place is being taken by bangles of that metal amongst the better-off, whilst among the poorer classes coloured glass and wood supply the want. Of late years a departure has taken place in the character of the *chúras* worn, illustrating an advance in taste: whereas formerly they were invariably painted either plainly or with some crude design, fashion now lays down that they are to be worn in the natural colour, and an old set of *chúras* fetches only about two-thirds the price of a modern uncoloured one.

The turning of billiard balls, which is confined to Ludhiána, is quite modern in origin; the trade in India is small, owing to climatic conditions rendering the use of bonzoline or composite balls more advisable, and what trade there is in this article is mostly export, when it has to compete with European firms which have the advantage of using material already seasoned to the climate of the market.

Some interesting facts regarding the industry are forthcoming from the various catalogues of different Industrial Exhibitions, held from time to time in Calcutta and Lahore. In the Punjab section of the Calcutta Exhibition of 1864, 375 articles were exhibited from Umballa, Amritsar, Dera Gházi Khan, Gujránwála, Hoshiárpur, Jullundur, Kángra, Lahore, Ludhiána, Patiála, Shahpur, Simla, and Sirsa, consisting mostly of figures, boxes, chessmen, knives, combs, handles, and bracelets; Delhi, the present centre of the trade, being conspicuously absent. At the Punjab Exhibition of 1881-82, only 111 articles were shown from Delhi, Lahore, Umballa, Ludhiána, Amritsar, Mooltan, Shahpur, Gujránwála, Hoshiárpur, and the inlayers of Basi Ghulám Hussain.

The Calcutta Exhibition of 1883 shows an advance in numbers, namely—101 inlaid articles and 66 specimens of carving, but the exhibitors were fewer. Mr. Lockwood Kipling, one of the secretaries, then wrote:—

"Ivory carving is not an art that flourishes in the Punjab. At Amritsar great quantities of combs are made, an industry which probably originated with the Sikhs, who are *Nazarenes* in the treatment of their hair and beard. The ivory combs, paper-cutters, and card-cases of Amritsar are ornamented with geometrical open-work patterns of some delicacy of execution, but no great interest in design. Figure work is but seldom wrought in this Province owing to the predominance of Mussalman notions, and the only figure-carver of Delhi, Faqír Chand, does not appear to meet with much encouragement."

This *resumé* of the art as it existed twenty years ago is true, with but slight alterations, of the industry of to-day. There has been since then an advance in one direction and a decline in another. Ivory carving has improved in Delhi and inlaying in Hoshiárpur, but in Patiála and Amritsar the industry has fallen on evil days.

III.—The Material.

The ivory used in India is drawn from three sources, viz., Africa, Burma and India itself. Burmese ivory does not seem to be used to any appreciable extent in the Punjab, and Indian ivory is at a discount. In comparison with the African article, the latter is inferior. The former when cut is of a warm transparent tint, with no appreciable appearance of grain, as it dries through exposure, the oil evaporates and the ivory itself grows lighter in colour. Indian ivory, on the other hand, when cut appears more like long exposed African, and has a tendency in time to assume a pale yellowish tint. The former is considerably harder, closer in texture and easier to polish, the lack of polish being one of the best criteria to judge whether an article is made of African or Indian ivory.

The opinion of experts on the quality of Indian ivory appears to be that its inferiority is almost entirely due to the food. Lála Faqír Chand states that possibly the fact that so many of the animals in India are owned by Rájas, who regale them partly with sweetmeats, accounts for the softness. Mr. Baden-Powell has written:—

"The ivory with which these carvings are executed is obtained from the tusks of wild elephants. The natives say that the tusks of domesticated elephants yield a brittle and inferior ivory liable to crack on exposure to air. My informant further asserts that the cause of the brittleness of the tusk of the domesticated animal is the salt that is given with its food."

As a matter of fact, the wild elephant in India affords but little material to the Punjab; the Tirai in Oudh alone is capable of furnishing any quantity, and that is a source which is but slightly drawn upon. The reasons, therefore, of the inferiority of Indian ivory are probably partly the surroundings of the animals, domestication and unsuitable food causing deterioration, partly climatic, and most of all an inferiority in breed.

The ordinary African ivory which is used in Delhi is mostly bought in Bombay, and costs in the block ₨ 20 to ₨ 24 per sér (2 lbs.); the best Indian ivory is usually charged for at the rate of Rs. 16; and inferior ivory of

both classes, costing from Rs.4 to Rs.10, is obtained from Amritsar, and used by the children who are undergoing training, and for coarser and cheaper work. The same prices range in Patiála where the purchasers buy in two markets—Bombay for large quantities, Amritsar for small.

The prices in Dera Gházi Khan, due possibly to the distance from the markets, rule a little higher when it is borne in mind that the best ivory is not in common use. The ivory is divided into three classes, roughly corresponding with definite qualities. Ludhiána and Jagráon derive their supply from Burma, South Africa, Zanzibar and England at rates varying from Rs.10 to Rs.15 per sér, this, of course, being far from the best quality.

In Amritsar, where the trade has during the last few years seriously diminished, the manufacturers in present times do not go direct to Burma, Africa, or Nepál for their material; whether they ever had any trade relations with these places is not clear, though there is a general impression that in past times the leading carvers imported their own ivory. Both employers and special artizans in ivory and "artizan proprietors" now import the raw material either from Calcutta or Bombay. This they divide into three classes according to the original source:—I. *Purbi*, that which comes from the east, whether from Burma or Nepál; II. *Surti*, which embraces importations from Bombay other than III. *Zanzibarí*, a term used to differentiate the ivory of Zanzibar from that of the rest of Africa.

The best specimens come from Africa and Burma, and are chiefly employed in the manufacture of *chúris*,—the Indian ivory, so full of flaws and cracks as it is, being useless for that purpose. Perfect samples from India are, however, sometimes obtainable; but whether these are then prized more than Burmese or African produce is not clear. Amritsar is always a fairly considerable depôt for the distribution of ivory throughout the Punjab, most of the towns where bangle turning is carried on in a small way indenting on this centre for their supplies. The quality, however, of the ivory imported by the Amritsar traders appears to be somewhat inferior to that used by Lála Faqír Chand of Delhi, due, no doubt, to the less ambitious work attempted.

Mooltan, like the other centres, derives its ivory from Bombay, Calcutta and Amritsar in the rough tusk, and the classification adopted is apparently not geographical, but according to the immediate market at which it is bought. The rough tusk, after importation in bulk, is rounded off; the circular piece is denominated *nag*, and the remnant, including the thinner end of the tusk as well as the interior, is called *gatia*.

The ivory imported from Calcutta (Mirzapuri) is esteemed the better quality, being whiter than that from Bombay (though this, I am inclined to believe, from what is the general impression left from information obtained from other sources and the explicit statements of those who know best, is very far from being true, I give the idea of the Mooltanis for what it is worth), commanding as *nag* Rs.22 per sér, while that of Bombay is purchasable at Rs.20; the *gatia* from both markets realising Rs.6 to Rs.8. Before using, the *nag* is further strengthened by the addition of wax to prevent its burstiug.

Hoshiárpur is supplied from Jullundur and Amritsar, as they are within easy and inexpensive reach; the individual workers, being poor as a rule, contenting themselves with procuring material from the nearest market. A cheap quality of ivory is preferred, as it is used only for inlaying, principally refuse after the turning of bracelets, and the inner brittle portion of the tusk. To some extent camel-bone is also used by the inlayers of Hoshiárpur, and, except to the expert, it is in inlaid work difficult to detect the difference; it is, however, more perishable and liable to decay, and quickly loses its gloss and brilliancy, though by polishing it can be temporarily restored. In addition, *chikri*, a kind of white wood, bearing a superficial resemblance to inferior ivory when new and polished, and costing about 2 annas per sér, is used either as a ground-work or an alternative to ivory.

Hoshiárpur ivory costs from 8 annas to Rs.5 per sér; the workers themselves are ignorant of the distinction between the Indian and African qualities. Lahore is supplied from Zanzibar, *viâ* Amritsar, Bombay and Calcutta, and the ivory tusk is on sale in the district at Lahore, Chúnian and Kasúr. Bombay ivory ranges from Rs.15 to Rs.16 per sér, and Calcutta from Rs.19 to Rs.20.

IV.—Locality of Work.

Except in very few instances, the ivory industry is confined to the large towns. The reason is not far to seek: from its nature it is not wide-spread; it is an art that appeals to a very limited circle, and to command a sale, the purchasers being almost exclusively European, it is necessary that the work should be conducted near a centre frequented by them. The only exception to this is in the industry of bangle-turning, which, as previously remarked, is carried on to some extent in every large town in the Province.

Ivory carving proper is confined to three cities—Delhi and Amritsar in British territory, and in the capital of the Patiála State. In the former city, Lála Faqír Chand of the Dariba practically monopolises the trade, and, in fact, there is no one in the Province who can in any way compete with him. In Amritsar, the quarter known as the "Darsheni Darwaza" contains nearly, if not all, the workers in ornamental products and the manufacture of toys, while the *chúrigars* or bangle-makers live and work in the "Katra Mohr Singh." In Patiála there are only three workmen, Mussalman in religion, employed to a very large degree by His Highness the Mahárája, they living at the capital.

Bangle-turning, though general throughout the Province, has its chief centres in the Amritsar, Dera Gházi Khan, Gujránwála, Mooltan and Lahore districts. Some of the best workers are those of Dera Gházi Khan, all of whom reside in head-quarters. In Gujránwála bracelets are made at Sadr, Wazirabad and Ramnágar, the most important merchant being at Gujránwála itself; he imports about Rs.1500 worth of ivory each year, so his trade must be of considerable extent. The supply of *chúras* is in the hands of five workmen, who have three shops between them. At Wazirabad and Rámnagar there are only two workmen, one at each place. These men are occasionally employed in making *surmádanis* and small buttons, In Mooltan and Dera Ismail Khan the workers have some local repute, and Lahore, in addition to having a few shops where ivory goods are to be bought, has four craftsmen of some skill in turning, all resident in the Dabbi Bazaar.

The great centre of inlaying work is the district of Hoshiárpur. Amritsar has a certain amount, and during the summer months some of the inlayers of Hoshiárpur locate themselves at Simla, charging double prices for the privilege of purchasing there. A little is done in Dera Ismail Khan, more of the nature of embossment than inlaying; and Mauza Phália, in the Gujrát district, possesses a few artizans who occasionally engage themselves in inlaying *charkhás* or spinning-wheels.

In Hoshiárpur, the four centres are Hoshiárpur, Pur Hiran, Khuáspur, and Basi Ghulám Hussain, the first-named being rather a depôt and the last-named being famous not only in India, but even throughout Europe and America. The turning of billiard balls is confined to the Ludhiána district, Ludhiána city and Jagráon being the two places where the industry, in conjunction with that of bangle-making, is conducted.

V.—The Workers and Dealers.

In the shop of Lála Faqír Chand of Delhi about 20 men are employed, the majority of whom are Brahmins, though the art is by no means confined to a particular caste or religion. Ivory carving in Delhi is almost exclusively hereditary, the system of training being long and arduous, which tends to the limiting of the acquisition of the art to families.

The training of the would-be artist commences at an early period, usually when the boy is about 10 or 12 years of age. For about four years the pupil is taught freehand drawing by the head-carver, or in some cases by his father, his apparatus consisting of a slate and pencil, or chalk, and his sketches being largely figures of animals, *e.g.* dogs, camels, and floral designs, advancing in difficulty as the youth attains to skill. From freehand drawing the pupil advances to model drawing, using as his models some of the ivory figures executed by the workmen in the shop. Some of the sketches, which I saw drawn by the only present pupil—a lad of 11—were of excellent quality. After the learner has attained proficiency in this first step he is given a file and a rough block of coarse ivory, and he proceeds to learn how to smoothe the ivory and render it fit for the next process at the hands of more experienced workers.

He is kept at this work for 2 to 2½ years, at the expiration of which term he is initiated into the art of sketching on the smoothed ivory with a lead pencil, reproducing on the ivory the same designs he learnt to draw on slate. From this he proceeds to delineate on the surface of the ivory the lines on which a full figure will be carved. When he has succeeded in adapting himself to his new material, he is provided with a piece of inferior ivory and instructed in the art of filing his figures on the surface. He is then gradually taught to pass from surface to block figures; and when he has attained to proficiency in the latter he passes on to the most difficult art of all—that of perforation, beginning first with coarse work and gradually attaining to the finest qualities, until at length he is able to turn out a beautiful figure richly adorned with tracery and perforated trappings. A good deal naturally depends on the individual himself in the progress he makes, but even with the advantages of hereditary instinct, application and natural gifts, it requires a period of 20 to 25 years of careful training before a workman can be trusted and considered proficient in all branches of his art.

The workers in Delhi are nearly all organised under Lala Faqir Chand, taking up the trade from father to son, as the master craftsman himself. There are, as far as I have been able to discover, no individual workers in Delhi; there appear at some time to have been a few, but their work was always inferior and their efforts short-lived; they were probably too poor to purchase the best class of ivory, or to pass (as is necessary over a perfect specimen) months, if not years, without receiving payment. The capitalist is, in default of the patron, a necessity for the best work to be produced. As it is, the master craftsman employs his carvers at a fixed wage varying according to the capabilities of the workman, supplies him with the material and sets the task, he himself taking the risk of sale, of the destruction of the material, and the long period of waiting before a return is made for the outlay.

The factory of Lála Faqír Chand is above the ivory shop in the Dariba. The workers are congregated in a small room along with the wood-carvers and the miniature painters; some sit on the balcony, some on the stairs, some by open doors and lattices, wherever they can obtain sufficient light to work by, surrounded by their primitive implements, the whole forming a typical scene of the Indian artist at work, the surroundings in which his work is done containing everything to make it difficult, yet the result is exquisite.

The wage of the workers varies from that of the lowest grade earning ₹s 5 a month to that of the best workman in the shop with his ₹s 50. Of course, the apprentice is paid nothing until he is of sufficient skill to turn out a saleable article. This he is able to do in from five to seven years, and the first wage for such employés rarely exceeds Re.1 a month. It is only the superior workmen who are entrusted with the better class of work. Some pieces represent the labour of two, three or even four years, and at the last moment a slight slip of an instrument, a careless movement of the hand in perforating, may ruin the toil of months, besides rendering valueless the precious ivory itself.

The tools employed are to European eyes of a decidedly primitive character, and it is a matter of more than ordinary surprise that such perfect work is produced by such inadequate means. Sketches of the tools employed in Delhi are shown in Plate 80:—1, 2, 3, the *ári* or saw used for cutting through the bark of rough tusk, for cutting off the bark, and for the final cutting into the required sizes, respectively; 4, the *kenchi*, cutters or splitters, used for cutting fine thin sheets of ivory into strips; 5, the *chhuri* or paring knife, used in preparing the work for carving; 6, the *chhuri* or finishing knife, used in preparing the work for turning and rounding off edges; 7, the *sohan* or file, used for finishing large work only; 8, the *sohan* or rasp, for finishing the rough edges of holes; 9, a flat rasp for square rough work only; 10-16, *birkas* or chisels, for small grooves; 15, used in place of our gouge; 17, 18, groovers used in clearing small grooved work; 19-24, assorted files and rasps; 25-29, assorted drills or *barmás*; 30-34, points and punches, used for clearing work from dust after polishing; 35-38, rabbetting plane-irons, *randa*, used for ornamental work round bases or stands, also for beadings.

The whole of the work is done in the factory under the direct supervision of the head-worker, and no one is allowed to do work at his own home, the finished product in every case being the master's. The profit of the master craftsman varies. On the side of expenditure—there is the cost of tools, the pay of the workmen (extending sometimes over several months while a piece is being prepared), and the frequent delay in selling the articles produced; for instance, there was until recently, in Lála Faqír Chand's shop, a beautiful carving of some Hindu gods which was executed some 50 years ago, and which was valued at Rs.2,500. On the other hand, an expensive article is sold, and good orders may come in from a wealthy patron (in the winter of 1899 one specimen was sold for the remunerative figure of Rs.,8000=£500), so that an average fair rate of profit can only be ascertained with difficulty. They are not extensive, and may safely (according to Lála Faqír Chand's estimate) be assessed at from 5 to 10 per cent on the original outlay, which, in view of the profits obtained in other Indian industries, is but a very slight return.

Lála Faqír Chand has his own shop in the Dariba, where the productions of his men are sold, and he also practically supplies the whole of the jewellers in the Chándni Chowk, who sell partly on commission and partly after purchase, but the best class of work is obtainable at the manufacturer's own shop.

The comparative inadequacy of the profits on ivory carving, no doubt, injures the production of highly-priced articles, and the risk of a considerable outlay producing no return unless a special order has been placed, added to the desire of obtaining cheap specimens, result in a large quantity of small and therefore cheap objects being manufactured. It should, however, be noted that the greatest skill is devoted to the production of specially ordered goods, and it is amongst them that the best specimens are to be found.

The organisation of the workers in Amritsar has many important differences. As far as this city is concerned, the workers may be divided into two classes:—I. Those employed in bangle-making; II. Those who are engaged in the manufacture of toys, figures, and ordinary useful articles such as combs, paper-knives, *surmadánis*, card-cases, boxes, and who prepare the geometrical and floral designs for inlay work in wood or metal. Some of these latter restrict their operations, as a rule, to toys or inlaid work; occasionally, when trade is slack, turning their attention to other kinds save only the cutting and turning of bracelets.

There are three castes engaged in the trade—(*a*) the workers in ornamental productions who are called Rámgariás or *tarkháns*, all Sikhs, due possibly to the great demand by the Sikhs of the neighbourhood for ivory combs; (*b*) the *chúrigars*, Khatrís by caste, who are proprietors of concerns where *chúras* and bangles are made, and (*c*) where the artizans are Mussulmans. The two former castes form a large part of the population, but the number of persons engaged in the ivory industry may be counted on the fingers of the hands. What is true of Delhi is true of Amritsar; there is no special caste identified exclusively with the art like the *sunárs* of the gold and silver industry. Of the Rámgariás there are about 12 persons employed in the manufacture of articles of use and ornament, while bangle-making claims another dozen of "Khatrí *chúrigars*," and in both cases the calling is hereditary.

As the work is less ambitious than that of the fellow artizans of Delhi, so the apprenticeship is less arduous and lengthy. Lads aged from 10 to 12 years are apprenticed (*shágird*) for at least six months or a year to a master craftsman, who puts the youngsters on to working on soft woods, then to harder woods, until both hand and eye are sufficiently trained, when they may be employed on the precious ivory itself without much danger of spoiling the work or material. Sometimes the apprentice is expected to offer a small gift of some sweetmeat to his instructor, but this is not enforced, and it might be taken, as a rule, that the articles of apprenticeship require neither a "fee" from the lad nor pay from the master. When the pupil has made some progress in the acquisition of the art, the teacher makes an allowance which is gradually raised to the pay of an accomplished workman. Sons often succeed to the business of their fathers: other relations may throw in their lot with their kinsman teacher or start fresh concerns of their own, but this (from the fact that the industry is not a growing one) must very seldom be the case, and is borne out by the fact that the number of shops has remained stationary for some years.

So far as the manufacture of toys and articles of use or ornament are concerned, the workers manage their own business in every detail—that is, the *tarkháns* or Rámgariás import their own raw material and work it themselves, assisted by one or two minor craftsmen and apprentices. In a small shop the working proprietor represents the whole establishment: in a few others the master craftsman employs a few hands, so that it might be said that both systems of working obtain in Amritsar. The result is, that as each worker has more or less to live by what he makes from day to day (there being no one of sufficient capital to permit of months passing while a perfect piece of work is being prepared), the best specimens of Amritsar work can only compare with the cheaper goods manufactured at Delhi; and it is a fact the more to be lamented that the exquisite productions of the latter place are not to be found here, since it cannot be many years ago when they were not widely separated rivals in the art. Those employed in bangle or *chúra* making work under somewhat different circumstances. Their business is represented by two classes of persons—the Khatrí *chúrigar*, who furnishes the capital and arranges for the import of the tusk, beside watching for the demand for the finished article,—and the actual artizan (Muhammadan), who is practically a servant turning out so much work for a given wage. The Muslim worker and his Hindu employer appear to carry out each his own part to their mutual satisfaction.

The tools used may be conveniently divided into three classes:—I. Those used in perforation work, carving and inlay work (Plate 80); II. Tools for the manufacture of combs (Plate 81); III. Tools used by the *chúrigars* for bangle turning. Many of these are similar in make and employed in a similar manner as tools used in wood or metal work, the names alone being different. For perforation work, &c.:—39, *Rethi* or file; 40, *Barma* or drill; 41, *Kath-kashi*; 42, *Parkár* or compasses; 43, *Hathouri* or hammer; 44, *Parkár* or fixed compasses; 45, drill-bow. The *rethi* (unlike ordinary files, which are straight) is curved like a scythe, and has teeth cut on each side of the flat surface which does the filing, while the edge is convenient to both cut and file. For combs:—46, the *ári* or saw; 47, the *patal*, a fine file used in cleaning between the teeth of a comb, and for making the

surfaces smooth between tooth and tooth; 48, the *thasul*, used in rounding the edges of the teeth on the outside, to prevent the hair catching or being torn by the sharp edge of the comb; 49, the *rethi* or file, rough cut on one side and smooth on the other.

After the outer surface of the ivory cylinder from which the *chúras* are to be cut has been made perfectly even and smooth by the *dutli*, the *chírna* is employed to cut a number of deep grooves representing the thickness of the *chúras*. The bangle is now almost ready; all that remains is to sever the several bands between the grooves from the parent cylindrical block, and this is done by the *singari*. This tool is a bit of flat steel, broad in the middle and tapering to a fine point at each end: the ends are well tempered, and the tool is used to turn the ivory bark by doing so towards the thickness of the tool. The length of the part thus turned is the breadth of the *chúra* to be cut. The tool is applied while the block prepared up to the second process is quickly revolved by the bow, and the bands made by the *chírna* come away from the tusk one after the other. The rings are now ready-made *chúras* or bangles, no polishing or other manipulation being necessary. If painting or lacquering has to be done, it is always done before the *chírna* is set to work.

In addition to the artizan who shapes and forms the various articles in ivory with his own hands, there are two necessary minor helpers, those who conduct the business of the *chírnawála* or sawyer, who saw the tusk into the proper sizes required for each kind of work before it is put into the hands of the craftsmen, and the polisher to whom it goes afterwards for a good finished surface. One or two sawyers do all the sawing required by all the shops in the city, and one polisher, with occasional assistance, disposes of the whole of the polishing. The remainder of the work is done in the shops already referred to, the worker in each class doing all that is necessary for his particular task. The more difficult part of the work in any one article is entrusted to the more proficient workmen in a shop or reserved by the master for treatment at his own hand.

Patiála is the third city in which ivory carving proper is conducted, and during the lifetime of the third Mahárája the special artists employed by him attained to a very high degree of proficiency. It appears that at the present time there are only three workers, Sheikh by caste, who preserve the knowledge of the art entirely in their own families. The old patronage which they formerly received is not extended to them as liberally now, and they are more or less dependent on what they can sell to passing visitors. The system is that of the small working proprietor, each man making and selling his own productions.

The tools they use are few—the saw, adze, turning-frame, knives, rasps and files,—all country-made, and the rate of profit is small, amounting, according to the report, to only 6 pies in the rupee, or little more than 3 per cent. The Patiála artizans employ themselves in the production of carving and bracelet-turning, but owing to the lack of means of disposal the character of the former is inferior.

Hoshiárpur, which is the great centre of the inlaying work and manufacture of decorative furniture, has also several people employed in bangle-turning. As is the rule at all places where bangles are made, only the outer bark of the tusk is used for the manufacture. The ivory bracelet is in exceptionally good demand in this part of the Province, and the majority of Hindu women hardly consider their trousseau complete without two or three sets. A set of these bangles, comprising sometimes as many as a hundred separate rings, is termed collectively a *chúra*, and frequently reaches from the elbow down to the wrist; and as the sloping of the arm corresponds roughly with the shape of a tusk, the outer rim of a tusk frequently finds its way in graduated bangles on to a woman's arm. The end of a tusk, which is too thin to permit of more bangles being made, is employed in the other ivory industry of Hoshiárpur—inlaying, with which the district is more generally associated.

The workers are, for the most part, ordinary carpenters, mostly Hindus, without being confined to any particular caste. They number about 40 at Basi Ghulám Hussain, 30 at Khuáspur, 20 at Sadr, and 10 at Pur Hiran, and in addition there are the children of various ages undergoing training, so that there are not many less than 200 actively engaged in this industry. As is the case in most Indian arts, the industry is hereditary, without being as exclusive as is popularly supposed, the children of an artizan taking to the father's trade without reference to his own capabilities. Inlaying does not require the same application and instinct as carving, and the reason of the industry being hereditary lies rather in the intense conservatism of the people than in the necessity for special gifts. This conservative peculiarity is illustrated further in this particular trade, for though the inlayers of Basi Ghulám Hussain have been known throughout the Punjab for three or four generations, and though the demand for decorative furniture amongst Europeans has led carpenters to adapt themselves to new forms, yet the peculiar inlaid work with ivory remains practically local.

The organisation of the workers is non-existent. Each worker works at his own home and for his own hand, surrounded by the members of his family, making the table or box, whatever he pleases, and completing it himself by inlaying it. When it is finished, he takes it to the bazaar and disposes of it to the best advantage he can to the dealer, who maintains a shop in the town, or wanders over the length and breadth of India from Pesháwar to Calcutta, to Madras and Bombay, carrying with him several hundred-weights of goods which he displays on the verandahs of the bungalows. There is hardly any one of the actual workers possessed of sufficient capital to command exterior service; the men appear, as a rule, to be extremely poor, and living as they do from hand to mouth, the main object of the artizan class is to dispose of the goods as soon as possible for what they will fetch.

Of training a description is impossible, as it is without method. It appears to consist mainly of mere intelligent watchfulness on the part of the boy looking on at his father working in the homestead, and picking up gradually the incidental points,—not a difficult task, seeing that from his cradle he is surrounded by those engaged in the work, and bit by bit imitating those whom he has been watching. The child is usually given a few hints at the age of 7 or 8, and with these he may be said to enter on his apprenticeship such as it is, and in the course of 10 or 12 years he becomes a capable workman.

The tools employed are those generally used by carpenters and ironsmiths for inlaying, engraving and setting. No progress has been made by the artizans in the improvement or invention of implements, though some English made machines are gradually coming into use; but the better work is still done by hand.

The profits of the trade appear to be extremely slight, the chief gainers being the middleman shopkeepers, who seem to have a kind of local understanding to keep down prices paid for the finished article, while charging the purchasers three and four times the amount they themselves have invested. On the rare occasions on which the artizans work for wages they receive from Rs.4 to Rs.16 a month, and Rs.10 may be taken as a fair average of the monthly income of the artizans when working for themselves, an amount which fades into insignificance by the side of the *bannia's* profits. The few artizans who themselves employ others make, however, a fairly handsome profit, sometimes as much as 100 per cent.

In Ludhiána, which may fairly be considered the centre of turning, both the manufacture of *chúras* and billiard balls find a place. In the town of Ludhiána the turners are Qureshi Muhammadans, who are the hereditary depositors of the trade, and who are commonly called *chúrigars*. The artizans are of the same faith, and also carry on the trade hereditarily. The organisation is simple, the turner working at home and selling the *chúras* either to order or to casual customers.

The turners' implements used in Ludhiána are fuller and of a more elaborate description than are employed elsewhere (Plate 81). The names are as follows:—50, *Jand*, the turner's frame; 51, *Kanda*, iron rod; 52, *Sua*, pointed pivot; 53, *Kamána*, bone; 54, *Subbal*, iron rod; 55, *Dhur*, turning axle; 56, *Loha rach*, pointed chisel; 57, *Mathni*, a broad chisel for smoothing; 58, *Singari*, used for cutting the ivory and separating the cylinder into bracelets; 59, *Chírna*, a fine-pointed handleless chisel; 60, *Rangwata* or *Agwartha*, polishing stick; 61, *Kher*, a fine-pointed chisel; 62, *Verma*, gimlet; 63, *Kalbut*, the wooden cylinder on which bracelets are mounted for colouring; 64, *Bambia*, stick to which the piece of ivory is fastened for carving; 65, *Tira*, a wooden pin introduced into the hollow of ivory while on the lathe; 66, 67, *Rachi* and *roda*, bars of iron worked into a blade at ends, used for turning ivory; 68, *Tesha*, adze; 69, *Ari*, saw; 70, *Chari*, hooked tongs; 71, *Rethi*, files; 72, *Tikera*.

The amount of work that an efficient worker can do in a day is astonishing, he being able to produce about eight sets of coloured bracelets a day, containing some 160 to 240 separate rings. The profits, however, are small, amounting to not more than 1½ anna per set; *i.e.*, 12 annas a day represents a workman's earnings. The turner of billiard balls can at most produce one set of three per day; the value of the ivory employed in a set is from Rs.16 to Rs.18. A turner receives when working for a trader Rs.3 a set; the trader charges his customer from Rs.3 to Rs.4 a set more: a good set being obtainable for from Rs.20 to Rs.24.

Mooltan is also an important centre of the industry of bracelet making, the bracelets being made from the *nag* described above, while the *gatia* is used for *surmadánis*, buttons, *dibiás*, small pen-stands, boxes, and chess-pieces of an inferior quality—all turned work, not carved. A full *nag* will supply from 150 to 175 pairs of bracelets. Only two qualities are manufactured here: the one thick and the other thin. As a rule, the workers work entirely in their own homes, and except in very few instances are piece-workers of the wealthy *mahájans* of the city. The usual practice is for the *mahájan* or banker to purchase the ivory and hand it over to the turner, who transforms it into *churas*, receiving in return pay by weight—for thin bracelets 8 annas a pound, and for thick 4 annas. An experienced worker can turn out about 150 bracelets in a day of six hours. There are only nine turners in Mooltan; the demand is much greater than they can supply, and a fair number are imported into the villages of the district from Dera Ismail Khan and Chiniot.

The same remarks apply to Dera Ismail Khan, where, however, there is a small industry in the hands of the ordinary *tarkháns* in the manufacture of ivory knobs and studs for affixing to lacquered wood-work. It is unimportant, and may be disposed of in the words of Mr. Lockwood Kipling:—

> "Ivory ornaments in the shape of knobs, studs and flowers ingeniously etched and carved are liberally applied. . . . . This practice arose in the first instance from the necessity for covering with an ivory stud the hole left in the ware by the iron lathe point on which it revolved. It is carried to excess at Dera Ismail Khan."

In Lahore the turners are Mughal by caste and the profession, as elsewhere, is hereditary. The boy of a family is invariably taught by his father, beginning when about 10 by making wooden *churas*, and then being set to prepare round articles such as *naukas* out of bone, eventually being permitted to use ivory.

The work is of a fair quality and the instruments used are only seven in number:—*Tábi* (a long iron plane), *chírna*, *singari*, *kherád*, *kamáni*, *sil*, and *tesha*.

Gujránwála calls for no further remark; the trade is practically in the hands of one, and the art of turning presents no special features there.

Dera Gházi Khan has a fairly flourishing trade, and one or two points require notice. The pupil usually learns his art by the use of cocoa-nut, and in a year's time can safely be trusted with ivory. The system of work is somewhat peculiar, similar to that which prevails in the manufacture of silver ornaments. The would-be wearer himself purchases the ivory and hands over the raw material to the workman, who manufactures the set sometimes at a daily wage, sometimes at so much per set. In the few cases where the workman provides the ivory, his usual charge is the price of ivory *plus* Re.1 per set, and his average profits range from Rs.20 to Rs.40 a month. The tools in use are the universal *chírna* and *singari*, and in addition the *kirpána* used for smoothing the ivory, and the *larhána* used for marking off the bracelets on the piece.

VI.—The Work and its Prospects.

In the factory at Delhi the carvers are confined to their particular branch, while side by side with them, under the same organisation and same roof, work miniature painters and workers in sandal-wood, and though the ivory carvers are frequently capable of working in the latter material, they are, as far as their respective crafts are concerned, practically apart.

As in all Indian work, there are certain well-defined stock models, which are reproduced time after time, possibly with slight variations in ornamentation as they suggest themselves to the fertile ingenuity of the carver. It would be a mistake, however, to imagine by this that they are incapable of working out of the beaten tracks, for not only are the best carvers possessed of considerable artistic feeling and imagination, and capable of repro-

ducing their ideas in ivory, but they are extremely adept in carving any figure or design which may be specially ordered, even from so unsatisfactory a model as a photograph. Some of the best work produced is that done under these conditions. The purchaser who desires a particular object carved must necessarily be wealthy, and the most skilful worker is put on to execute the commission, the price, of course, being naturally heavier than what is usual for specimens of stock designs.

It is a pleasing feature in the work that most of the designs are essentially Indian, and the craving after European models so characteristic of other Indian arts has not as yet begun to influence the Delhi carving to any appreciable extent, and consequently there is an absence of deterioration to imitation.

The characteristics of the work may be roughly divided thus:—I. Figure or model carving; II. Perforation; III. Tracery, usually floral. These three characteristics are frequently combined in a single specimen, and it is only in the cheaper model specimens that ornamentation is not introduced. Of the three the former is the least satisfactory. There is in every figure a certain unnatural stiffness, a want of flexibility in appearance. Even in highly-carved elephant figures, where the trappings, chains, decorated *howdahs*, &c., are exquisitely executed, the general effect is somewhat marred by the clumsiness of the central figure. It is often a little exasperating after admiring the perfect symmetry of the tracery designs to be confronted with an animal, round which these designs are worked, apparently taken out of a child's Noah's ark, without joints, and with its left side invariably concave and its right convex.

For this there are two reasons—the one historical, the other the result of the material in which the work is executed. There is no doubt that the long period of Mussalman predominance, with its attendant discouragement of the production of animal figures, has had a limiting influence on ivory carving, as it has on all Indian arts. The practical proscription of anything which might tend to be construed into an image has so effectually discouraged the art of producing them that the best work must be sought for in what was a legitimate subject for representation. The other reason is the desire to as far as possible economise the material used. The result is, that in order to prevent waste, the carver works as near the outer bark as possible, and as there is in the tusk itself a natural curve, the effect on the figure is that noted above—the peculiar lop-sidedness (if I may use a forcible term) of the animal. Besides the desire to economise there is a further quality in the ivory itself which leads to the same result, *viz.*, that the further you get away from the bark the poorer becomes the ivory—more brittle, more liable to discolouration, and harder to take on polish.

The Jury Committee of the Exhibition of 1864 described Punjab carving as being at a low ebb. This still appears to be true, to some extent, of figure carving, though even the figures of Delhi compare not unfavourably with the best specimens of Burma. This opinion, moreover, is to be read with one important modification, for it should be remembered that the best work of the Province, that of Delhi, was not represented at the Exhibition, and there is a considerable difference between a model of the value of Rs.2,000 from that place and one of Rs.20 or Rs.30 from Amritsar, the only survivor of carving proper of the Punjab exhibitors.

Tracery designs, geometrical and floral, of the most intricate character are exquisitely worked, and the same design (for instance, in the handle of a paper-knife) is reproduced time after time without the least discrepancy. Descriptions of such designs are impossible, but they all display a real artistic feeling amongst the workers. There is nothing so striking as the comparisons between the caparisons of a figure and the figure itself, or between, say, two paper-knives, one with an animal design and the other with a floral pattern.

The most difficult work of all is that in which Lála Faqír Chand's workmen excel—perforation. Two of the best specimens, to which no reproduction can do justice, are (1) a chain attached to a *howdah* on one of the elephant figure made of a solid piece of ivory—elephant and trappings—with the links interlaced and separate, each link not being greater than the size of a pin's head, the whole chain containing upwards of 50 links; and (2) the head of a paper-knife, the exterior being a beautiful floral design closely worked, and the interior hollowed.

In connection with ivory carving there is an interesting adjunct—miniature painting—conducted in Delhi. The two industries are closely allied, but the latter is outside the scope of this monograph, and all that is necessary to note here is the method of preparing the ivory for the painter. The ordinary method is by sawing the tusk with a fine saw into long thin plates, which are subsequently cut as required into various sizes. The plates are then generally placed in a press with the object of preserving the flattened shape, and kept in that position for four to nine months, until they become properly dry, seasoned, and clear of oil, and there remains no further danger of cracking or discolouration. On being taken out, the plates are subjected to frequent and careful planing with instruments, gradually becoming finer and finer, until at length they become perfectly smooth and are passed over to the polisher, who, after polishing them for some time with chalk, completes the process, and the plates are ready for the miniature painter.

Those causes which operate against the development of other Indian arts are to some extent apparent here. The daily increasing proximity of Europe leaves the present Anglo-Indian with less inclination and power to patronise native art in the way and to the extent his predecessors did, and there is a constant tendency to more and more Europeanise the ornamentation of a bungalow, with the attendant result that natives adapt themselves to the production of articles more and more on a European model. The increase of communications internally, resulting as it does in the constant changes of officials, leaves the latter with less desire to accumulate articles liable to destruction, and there is also the constant tendency to estimate the cost of labour on the basis of that of the unskilled artisan, and Europeans expect to obtain articles in India at a ridiculously lower rate to what they could purchase them for in England. The idea that the prices asked are excessive is not in the ivory trade a just one, but the natural result on the industry itself is the production of inferior work to satisfy the market.

The levelling tendency of British rule, while it has, on the one hand, bettered the condition of the mass of the people, has by the gradual absorption of the wealthy classes and the reduction of native courts, removed the greatest incentive—that of patronage—that native art possessed; and though the country be wealthier, the wealth has the tendency of gravitating from those who had the desire to encourage art, to a class which has no pretension to artistic feeling.

A MONOGRAPH ON IVORY CARVING.

By CECIL L. BURNS, Acting Principal of the Sir J. J. School of Art, Bombay.

I.—Composition and Varieties of Ivory.

Ivory is a dental substance, placed by chemists between bone and horn: that variety which is distinguished by the decussating curved lines on the surface of the transverse section of the tusk is peculiar to the African and Asiatic elephants; but the tusks of the walrus, the narwhal, and the hippopotamus, and the teeth of the same animals, also furnish ivory. The tusks of the elephant furnish the chief supply of ivory. In the Great Exhibition of 1851 were a pair weighing 325 lbs. obtained from an animal killed near Lake Ngami, in South Africa: each tusk measured 8 feet 6 inches in length, and 22 inches in basal circumference. It is considered that the tusks deteriorate in length and quality by the domestication of the elephant. African tusks are preferred to the Indian as being denser in texture, and not so liable to turn yellow. The demand for ivory for knife-handles, billiard balls, keys of musical instruments, mathematical scales, chess-men, for inlaying, for thin plates for miniatures, for carving, and for various other purposes is so enormous, and the supply is so well maintained that surprise may well be felt that the noble race of animals which yield it has not long since become extinct, especially when we consider that the supply of small tusks annually used is so vast as to reduce the average weight of the whole to about 9 lbs. per tusk. Teeth under from 10 to 16 lbs. are called scrivelloes. A few years ago it was calculated that the consumption of ivory in Sheffield alone required the annual slaughter of 22,000 elephants. The collection of broken or shed tusks may somewhat mitigate the zeal of the hunter, and we may also refer to that remarkable source of ivory, which exists in Eastern Siberia and the Arctic marshes, where the tusks of the mammoth, and other animals, are collected in vast quantities, and sold under the name of Siberian or Fossil ivory, although they do not appear to have undergone that species of transmutation implied by the term fossil, but are as useful to the artist or manufacturer as recent ivory. It is not certain whether fossil ivory is imported into this country, although it is extensively used by the ivory-workers in Europe.

Regarding the elephant's tusk as ivory, properly so called, we may distinguish between African and Asiatic ivory, by the former being, when recently cut, of a mellow, warm, transparent tint, with scarcely any appearance of grain, in which state it is called transparent or green ivory; but as the oil dries up by exposure to the air, it becomes lighter in colour. Asiatic ivory, when newly cut, appears more like the African, which has been long exposed to the air, and tends to become yellow by exposure. The African variety has usually a closer texture, works harder, and takes a better polish than the Asiatic. The teeth, however, of both kinds vary greatly in quality and solidity, so that the choice by the purchaser is always hazardous; he is usually guided by the appearance of the rind, which should be smooth and free from cracks, and of the tip, where the rind is to a certain extent worn away, but it is not until the tusk is cut up that flaws, cracks, and imperfections can be detected. It occasionally happens that the musket ball of the huntsman, which failed to kill the animal, has become embedded in the tusk, and encrusted with a fresh deposit of bony matter, to the great injury of the ivory. Gold and silver bullets have on a few rare occasions been found, showing that the shot was fired by royal hands.

The tusk or tooth, as it is generally called, is usually solid for about half its length, circular or elliptical in section, and free from vessels, or pores such as occur in bone; and although containing a large proportion of lime, it has none of the harsh, meagre character of bone, but admits of exquisite smoothness, and displays all the niceties of the turners' and carvers' art in the slenderest proportions.

II.—Peculiarities and Methods of cutting Ivory.

Much judgment is required in cutting up a tooth so as to apportion the various parts with economy. The ivory saw is a blade from 15 to 30 inches long, and about the fortieth of an inch thick, set in a steel frame and tightly stretched, so as to make a very straight cut. The outside strips or spills, as they are called, are used for the handles of penknives; the scraps are burnt for ivory black; and the clean shavings and saw-dust are used for making jelly or size. The mode of cutting up the tooth must of course depend on the uses to which it is to be applied, but in any case it is desirable to mark out the tooth in some way beforehand, and also to pencil out the end of the piece before the saw is used longitudinally. The ivory shrinks in the direction of the length of the tooth, as well as in the width, but much less in the former than in the latter direction. A billiard ball will vary in its diameters if used in a room of different temperature to that in which the ivory was kept, so that it is usual to turn the balls roughly to shape, and keep them for some months in the billiard room before the turning is completed.

The thin plates of ivory used for the keys of pianofortes, inlaying, and similar work, are usually cut from the solid block by means of a fine feather-edge veneer saw, in which case there is a considerable amount of saw-dust. The Russian method of cutting veneers spirally from a cylinder of wood, with a knife of the same length, has been also adopted for ivory, although in such case a reciprocating saw is used, and ivory-dust produced. Mons. Pape of Paris furnishes veneers of this kind as large as 30 by 150 inches, and he has veneered a pianoforte entirely with ivory, though the result was not pleasing, In the United States department of the Great Exhibition of 1851 was an ivory veneer 40 feet in length by 12 inches in width.

The following is a description of the method of turning bangles at Tando, Sind:—The piece of ivory is first peeled and made clean with a hatchet. It is then fixed in a wooden frame specially made for this purpose, the ends of the ivory piece being fastened to two pointed iron bars on each side of the frame, which is called *jandi*. The ivory piece is then turned with a wooden shaft attached to a portion of the frame, and is rounded with an instrument having a sharp end, called *karmno*. The piece is then smoothed with an instrument called *mathni* and

is marked into lines, round in shape, with an instrument called *baraki*. The lines so marked are then separated from the piece in different layers with an instrument called *chhino*. The first layer will bring out the largest bangles, the second layer smaller ones, and so on, the bangle of each layer being snatched up with the aid of an instrument called *putho*. Lastly, the sides of the bangles are smoothed with an instrument called *kimdho*.

It will be seen that the method here pursued is much slower and more crude than that practised in Europe, and that a greater waste of material takes place, no use apparently being made of the small chips and saw-dust. The consequence is that the advantage possessed by the Indian workman in the cheapness of his living and labour over his European fellow-workman is neutralized, and whenever they come into competition the Indian workman goes to the wall.

III.—The Dyeing, Bleaching, and Restoration of Ivory.

Ivory may be dyed in various colours. The crimson red colour commonly seen is given by dipping the ivory for a short time into a mordant of nitro-muriate of tin, and then plunging it into a bath of Brazil wood, cochineal, or a mixture of those substances. A scarlet tint is produced by lac dye, and if the scarlet ivory be plunged into a solution of potash, it changes to cherry red. A yellow dye may be produced by giving the ivory the tin mordant and digesting it at a gentle heat in a clear decoction of fustic. A black dye may be given by boiling the ivory in a strained decoction of logwood, and then steeping it in a solution of red sulphate, or red acetate of iron. In dyeing ivory the surface should not be polished until the dye is set. As soon as the ivory is taken out of the hot-dye bath, it should be plunged in cold water to prevent the chance of cracking; and should the dye appear in dark spots or patches, they should be rubbed down with chalk, and the ivory be dyed once more.

When ivory has become discoloured it is not easy to bleach it. Some recommend that it be scrubbed with sand and water, but this is evidently inapplicable to works delicately carved by hand or at the lathe. Articles in ivory, which have suffered partial decomposition by exposure to air and moisture, have been restored by boiling them in a solution of gelatine. Such was the case with some works in ivory sent from Nineveh to England by the late Sir Henry Austin Layard. They were in a state of decomposition, and the method of restoring them was suggested by Professor Owen. An attempt has been made to render ivory flexible by removing a portion of its lime by the action of hydrochloric acid. This plan has been adopted by a surgical instrument maker, M. Charriere of Paris, who first gives the pieces of ivory their required form and polish, then steeps them in dilute acid, until they have become supple and elastic, after which they are taken out and dried, when they again become hard, but the flexibility can be restored by surrounding the ivory instruments with wet linen, or by placing wet sponges in the cavities of the pieces.

IV.—Ivory Carving and the principal objects for which Ivory is used.

In India ivory has been used since the earliest times for the production of useful and ornamental objects. Articles made from a single piece have necessarily been limited in size to the width and length of the tusk, therefore ivory drinking cups and large vessels intended to hold liquid are rarely met with. The principal objects cut from solid ivory are small round boxes for holding powder or sweetmeats, the handles of swords, daggers and knives, brushes and combs, small figures, balls, chessmen, buttons, &c.

Large articles are either built up from numerous small pieces jointed together, or are firstly made of wood which is cased or sheathed with plates of ivory fixed with cement or by means of rivets. On Plate 87 are specimens of ivory built up entirely of small pieces of ivory jointed together at each angle, while the top is carved from a solid piece. These specimens are from the collection in the Museum of the Bombay School of Art, and were made at Bhúj. They are some of the best examples of the art of ivory carving produced in Western India that have come under the author's notice. It must be confessed that compared with the work produced during the middle ages in Europe and in Japan before 1860, the old Indian work is childish in its technique and poor in design. It has none of the exquisite feeling and beauty of workmanship of the former, nor the complete craftsmanship, humour and insight of the latter. As the Indian workmanship has since steadily deteriorated, its exhibition upon ivory certainly does not justify the slaughter of the intelligent animals who produce it; in fact, the crude and incoherent scratchings of modern workers would not be so glaring in their incompetence, nor so obviously misplaced were they practised upon ordinary bone instead of upon this more precious material.

V.—Of the Technique of Ivory Carving.

Ivory has an extremely hard surface and is very brittle and at the same time is close-grained. It is therefore in many respects an ideal material for use in the lathe where the turner knows his business, but in carving it has to be treated very differently from wood. Being so extremely hard and brittle it is necessary, in order to carve it, to render it softer, by artificial means while the work is being carried on, but at the same time not to permanently alter its character.

In order to effect this, the ivory is wrapped in wet cloths, in which it is allowed to remain for several days, the cloths being continually re-damped. When this period has passed the ivory will be in the desired condition for carving, and will be found to cut with a consistency more like the softness of cheese or wax than the brittleness of bone. All the deep parts of the background are drilled out to the required depths with small drills such as are used by goldsmiths, set in a revolving handle to which motion is given by means of a bow worked with the operator's right hand, while the drill handle is held with his left. The fretted portions of the design, if such there be, are also first drilled through, and then cut into shape with a small fret-saw. In consequence of the natural brittleness of ivory, great care and judgment have to be exercised in deciding the sequence of the work when parts are fretted and parts carved in order to prevent the former parts from breaking away under the inevitable strain of the carver's tool. There is a modern tool which has been adapted to ivory carving in England by

Professor Herkomer, R.A., and which the author has also used. It is the small revolving burr or drill upon a flexible shaft, used by dentists for preparing teeth for stopping, worked either by the foot or by an electric motor. The great speed at which it works, between 3,000 and 4,000 revolutions a minute, reduces the amount of pressure necessary to obtain a cut to a minimum, and the great variety of drills, from those measuring one-eighth of an inch in diameter to those with points as fine as a needle, enable the operator to obtain not only all the effects possible with a graver and chisel, but many, especially in the way of under-cutting, quite out of the range of those tools. When this machine is worked by an electric motor, which gives it a steady speed of over 4,000 revolutions, not easily conveyed by a foot treadle, it is an ideal implement in the artist's hand for ivory carving, and is infinitely more expeditious than any of the older methods.

VI.—The present centres of Ivory Work and condition of the Industry in Western India.

Ivory carving in Western India cannot now be said to exist at all as an industry. Inquiry in nearly every Collectorate, district, and large town in the Bombay Presidency elicited the information that only in those named below is any trade in ivory goods carried on, and in each the demand is purely local. In none can the work be dignified by the title of carving as the accounts which follow will amply testify.

Hála.—In Hála there is a certain amount of ivory working, and a good idea of the local skill can be obtained at a shop in Hyderabad. The owner, Asharandass, a Sindhi Bania, has a small Rája's car drawn by two bullocks on a stand. He did not know where it had come from, as he had bought it, but he believed it must have come from Jaipur. This is mentioned chiefly to draw a contrast between it and his own work. The bullocks are very good in modelling and in proportion; they are about 3½ inches long and are not conventional in execution, but are evidently an attempt to reproduce nature, probably from the artist's memory and not from a living object. The Sindhi carver, on the other hand, when not copying, restricted himself to fashioning purely conventional representations of birds or animals suggesting monkeys or storks, upon the tops of penholders and implements like paper-knives, but used it is said for smoothing the hair on the temples under the turban. In another shop, that of Isar, the end of an ear-cleaner was fashioned roughly into a human hand, showing a somewhat higher degree of skill than the monkeys or storks. Similar wares are to be seen in Tando Alahyar. Both Banias, Isar and Asharandass, seem to take their ideas from foreign objects of a much higher order of work, some of which they had actually copied, and not from nature, as there are no monkeys in Sind. A few other Sindhi workmen appear to know these patterns and reproduce them from memory. Besides the bullock-car which he had not attempted to copy, Asharandass had made accurate copies of two figures of men dressed like English Puritans, but the work was quite simple, and the execution about as good as that of the figures in a child's Noah's ark.

In Tando Alahyar very pretty ornamented hair-smoothers were formerly made, but the industry has died out. A workman here was recently asked to make a Hindu idol, and about three weeks later, he produced a figure on a stand, about 4 inches high, of a man holding an umbrella above his head, with a dog at his feet. He wore a kind of Henry VIII hat, and a coat drawn in by a belt and reaching his knees. The figure was one inch through at the deepest part. The work was very plain and the arm not holding the umbrella was akimbo, and had been hollowed away to an absurd extent through unskilfulness. As the whole thing was carved in several pieces, the man, the dog, and the umbrella were detachable. The eyes and lips of the man were coloured very coarsely. Where the workman got his pattern from, or whether he evolved it from his memory, does not appear. The demand for ivory carving is at present so small, that it is doubtful if a really good workman could get a living, but whether the poor demand is in consequence of the inferior quality of the work or *vice versâ*, is difficult to decide. Coloured and dyed ivory is produced in Hyderabad; and Gangu Sindhi, Bania, makes imitations of red chillies with green stalks, certain bulbous vegetables dyed green, and flowers dyed red, which are however not copied from nature. The red dye was extracted from babul trees, the green was imported; whether they were "fast" was not ascertainable. The rest of the work in this division is turned on the lathe. The ivory worker's chief business is in plain armlets, and any carving of figures is more an amusement than business. A certain Nur Mahomedshah of Hála turns small plain studs, in the heads of which he puts glass beads, and also turns neat egg-cup-like objects with lids. These he ornaments with a simple but pretty wreath-like device in red and black. The men referred to above are the only ones known to carve in ivory, but a very considerable trade is done in the plain armlets, there being numerous ivory shops in all towns of any size, whose sole business is the production of these rings. The women cover their arms with them till they look as though they were encased in ivory.

Kánara.—There is no such industry as "ivory carving" regularly carried on in this district. There are, however, a few "Gudgars" whose chief calling is carving on sandalwood and painting, who at times carve ivory also. They are found in Kumta, Banvási, Siddápur, Bilgi, and a few other places in this district. They generally work on ivory, to order, and seldom offer articles for sale, except such as have been condemned by the person who ordered them. The articles made are generally small boxes, combs, sets of chessmen, images, paper-cutters, card-cases and other fancy articles. Ivory is not commonly to be had in this district. It is imported from Bombay or Mysore. It generally costs from Rs.2 to Rs.4 for a seer of 24 tolas, and when worked upon, the articles are sold for an amount varying from Rs.10 to Rs.50, according to workmanship.

Karáchi.—Ivory carving in this division is carried on in the town of Sehwán only. The trade consists almost entirely in the manufacture of sets of plain arm rings called "Bahin" when they are full-sized and "Gabha" when they are for children.

Poona.—The following is an account of the founding of the ivory industry of Poona:—Savai Madhavrao Peshwa (1780–1795), a youth whom Nana Fadnavis' restraints drove to suicide, found in the sacred books a law against Brahmin women using metal hair-combs. It was therefore decreed that combs should be of ivory. To supply the demand for ivory combs which sprang up in consequence, one Audutrao Dhandarpalkar came from Násik and opened the first ivory comb factory in Poona city. His example was followed by Abaji Ava of the carpenter caste. The family of Audutrao cannot be traced and is said to have died out. The original carpenters

have also left Poona and again taken to wood-cutting. The present ivory comb makers are the descendants of the Kunbi servants of the original workers. They number about fifteen and keep five workshops opposite the temple of Ganpati in Kasba ward. They are a quick people, speak Maráthi, live in their own one-storeyed houses, occasionally eat flesh and dress like ordinary Kunbi Maráthas. Comb-making is easy to learn. Many Kunbis would have taken to the craft, if it had offered a fair chance of making a living, but for many years, owing to the competition of cheap foreign bone combs, the industry has been depressed. Within the last ten years four shops have been closed, and those workmen who are left, though above want, are poor. The present small ivory comb industry will probably continue, unless it is killed by the importation of European ivory goods. Bráhmin and other high caste Hindu women think bone combs impure, and three ivory combs always form part of the *vayan* or bride's outfit.

Comb-makers work from seven to eleven and from two to sunset. Their women and children give them no help. During the marriage season between October and May, the demand is brisk, and sometimes one or two assistants are employed in doing the rougher parts of the work. The assistant is paid Rs.4 to Rs.7 a month according to the nature and quality of his work. The average monthly income of a comb-maker varies from Rs.15 to Rs.22½. As ivory is very costly, ranging from about 8*s.* to 11*s.* the pound (Rs.150–200 the 38 lbs. *man*), the money required for buying it has to be borrowed. The usual rate of interest paid is 1 per cent a month. The advances are generally made by a moneylender named Jipa Márwári, in whose hands the whole industry practically lies. In addition to interest he charges 1¼ to 1½ per cent as commission on the ivory he brings from Bombay. The workmen have to sell the articles they make on their own account and to pay the standing balance, including interest and commission, to the Márwári moneylender. What they are able to keep back is just sufficient to maintain themselves and their families. All are indebted to the Márwári. The appliances of a comb-maker are similar to those of an ordinary carpenter, only a little finer. Each shop requires five to six saws of different sizes worth 9 to 12 annas; half a dozen files worth 6 to 7½ annas; four or five borers worth 3 annas each; half a dozen vices each worth Rs.7½ to Rs.22½; a *vâkas* or adze worth Rs.1½; a *khatávne* worth 1½ annas; and a pair of compasses worth 6 annas.

When the ivory is brought from the Márwári's shop, after he has weighed it and entered the price in his account-book, it is steeped in water for two or three days. It is then cut into pieces of the required size and sawn through, keeping it vertical by holding it in the vice. It is then filed, rubbed and polished. Sometimes the ends and sides are decorated with carvings, and the plain surface is broken by tracing on it a few curved and straight lines. Combs for the use of women are rectangular, and have a double set of teeth, while men's combs are crescent shaped and have only one set of teeth. The small pieces of ivory left over in cutting out pieces for combs are used in making dice. The price of a comb ranges from 6 annas to Rs.1½, according to the size, thickness and workmanship of each. The combs and dice are sold in the workshops by the workers on their own account. Their only customers are high class Hindus. Other classes use either wood combs or foreign horn combs.

To this account it is only necessary to add that the ivory used in the industry is brought from Bombay, and costs Rs.12 to Rs.15 per seer. Nowhere else in this district is ivory carving to be discovered. The economical reforms and changes which the Indian hand industries have undergone by virtue of their having been brought into close contact with the more efficient industrial system of Europe, have, it is clear, in this case as in many others, reduced to a state bordering on extinction the hand manufacture of ivory combs in the Poona city. We have not perhaps any great cause to deplore the substitution of machine-made for hand-made combs, inasmuch as the former must necessarily be considerably cheaper, while it is doubtful whether the latter possess sufficient artistic superiority to counterbalance this obvious advantage. It is presumed that the scruples against the use of combs made of bone have long ago been met by the introduction of machine-made combs of ivory which are a common article of trade in this country.

SURAT.—In Surat no great demand exists for work in ivory, in consequence of such articles, whether for use or for ornament, being sold at higher prices than imported goods of a superior class. A small trade in such articles as are made is carried on with Bombay and Madras.

The principal items of manufacture are bangles of ivory, which are turned in different sizes, though the shape is the same for all. This is done on an ordinary wooden lathe, when they are either coloured deep red or are covered outside with thin sheets of gold or silver. The former are worn by women of almost all the lower classes of Hindus only. The prices of such bangles vary from Rs.5 to Rs.15, if simply made of ivory; but when covered with gold or silver, the prices exceed these in accordance with the quality and quantity of metal used.

There are a few *Hinghratia* or ornamental boxes used for preserving *Kankoo*, a mixture of turmeric and carbonate of soda, or vermilion invariably employed by natives—especially the women—when engaged in sacred duties or marriage festivals. It is applied in a wet or dry condition to the arms, chest, ears and foreheads by means of the fingers or small round sticks. Even on ordinary days, women of almost all classes have *Chanlas* or small red circular spots or marks in the middle of their foreheads, which are not only taken as signs of good omen, but are considered to add to the beauty of their faces. This practice is, however, only followed by married or unmarried ladies and girls, while it is prohibited altogether to widows.

Snuff-boxes, buttons, dice (of different sizes), combs for dressing hair, paper-knives, English alphabets, small pictures carved in relief and ribbons for carved sandalwood boxes, &c., are also prepared from ivory. Some of the vegetable products are represented in a crude manner in ivory, no fixed price being charged, but depending upon the time and quality of the workmanship of the articles prepared.

In no other town or district in the Bombay Presidency is there any ivory carving practised. The industry may be considered, therefore, as approaching extinction, a result which will be hastened by the discovery in Europe of several artificial substitutes for ivory, which are free from some of the drawbacks found in that material. There is no prospect of a revival of the present industry, but every likelihood of its more or less speedy death.

IVORY CARVING IN ASSAM.

By JAMES DONALD, Esq., Assistant Commissioner, Golaghat.

Once an important art in the days of the Ahom rajas, ivory carving has, since Assam came under British rule, gradually declined. In those past times the industry throve; the workers, patronised by the rajas and leading men of the court, received, as a return for their work, free grants of land and labour. In consideration for these privileges, a special class of workers, known as Khanikars, worked solely for the rajas. This would seem to indicate that the work in those days was much valued. Coming to a more recent period, we read as follows in Sir W. W. Hunter's Statistical Account of Assam, published in 1879:.

"Another speciality of Sylhet manufacture is ivory-ware, the carvers of which are characterised by much ingenuity and taste. Their work consists of ivory mats, which are sold at from £20 to £60 each, fans from £1-12 to £2-10, sticks from £1-12 to £2, chessmen from £3 to £5 a set, dice from 3/- to 6/- a set, and *gutis* (the pegs which pass between the great toe and the toe next to it to prevent the sandal from slipping off the foot) from 2/- to 3/- per pair."

As regards the Assam Valley, the only mention made by him of the industry is that in which he states that the industry is non-existent in Lakhimpur. In 1891, the census showed 4 ivory carvers in the whole of Assam,—3 in Kamrup, 1 in Sibsagar,—while the Deputy Commissioner of Sylhet now states—"Ivory carving is a practically extinct art now in Sylhet." Bringing the information up to date, we might safely say that there is but one man in the whole of Assam whose occupation can be described as "Ivory carver,"—Fiznur, Mussalman, of Jorhat. From an important flourishing and honourable industry, it has, in the space of 70 to 80 years, been reduced to the work of one man, and that spasmodic. To what causes then are we to attribute this decline?

The demand in the past must have almost entirely been supplied by the rajas. The demand was, however, sufficient to occupy under one raja the full time of some 40 men. But could it be said that with the disappearance of the rajas the demand entirely ceased? I doubt it. Was there then no scope for the ivory carver's abilities? Here the Assamese character asserted itself. Under the rajas the work was not altogether an optional one. There was a compulsory element. Care was taken to see that each man was kept busy at his trade, while at the same time the means of livelihood was certain. With the disappearance, however, of the rajas these influences ceased. The carvers, who had land and capital, settled down principally to a life of agriculture—a life involving little labour on their part, yet ensuring a comfortable living. Not pressed by want, or compelled by force, to earn his livelihood, the ivory carver took no steps to push his industry, or to create a demand. An occasional order for an article in ivory would be executed generally at a profit so considerable that the worker could afford to lay aside his tools for some time before undertaking another commission. What was the result of this? What was spasmodic in the parent became despised by the child; he saw in it merely a secondary means of livelihood, demanding long and much perseverance, with no immediate prospect of prosperity. Their inclinations, if of good family, tended, as in the case of the son of Fiznur, the well-known carver in Jorhat, towards an office stool.

Another cause, which has led to the decline of the industry, is the "ivory" itself. The rajas themselves used to have a large number of elephants, and from these, as well as from wild elephants killed, an ample supply of ivory was obtained. But with the introduction of the Elephant Preservation Act and its extension to the hills districts, ivory is at the present time rarely procurable. It is occasionally obtained from the owners of dead elephants, or from the tusks of dead elephants found in the jungle, brought to headquarters and sold. The purchasers in the latter case are, however, generally Marwaris or Kayas, who send the tusks to Calcutta for sale at a profit. Abors and Nagas kill wild elephants beyond the Inner Line, and the tusks they sell to Marwaris in Dibrugarh. This, too, is generally exported, except for an occasional demand by an ivory carver. But even these exports are very small, as the trade returns show, and have been gradually declining, being 17 maunds in 1897-98, and 1 maund in 1898-99. It might thus seem almost superfluous to enter into any detailed description of the work of the ivory carver in Assam. We have found but one man whose occupation can be described as "ivory carver," but there are others who, while dependent for their living on other occupations, still possess a knowledge of the art. In the case of all, however, the work is spasmodic, and generally dependent on occasional orders received—generally from Europeans—which orders they do not always take the trouble to execute. The ivory carver in Sylhet (his principal occupation is that of goldsmith), whose speciality is fans, has received but one order for fans during the last ten years. No other orders has he received either from Europeans or Natives. And the others are in a similar position, although in the case of one or two more frequent demands have been made for their work.

The number of persons in Assam, who are acquainted with ivory carving, may be roughly put down at fifty. Of these, about forty depend for their living on agriculture, while the others have become carpenters or brass-workers. The industry has been at no time confined to any particular caste, the old class of Khanikars being composed of both Hindus and Mussalmans. The surviving representative of the Khanikar class is Fiznur, Mussalman, of Jorhat, whose family possessed the title of Khanikar Boroja—a title given by the Ahom rajas as signifying special knowledge in ivory carving. Of these fifty carvers, about forty reside in Goalpara, depending mostly on agriculture for their living; six in Manipur, whose general work is carpentry or brass-work; two in Kamrup, and two in Dibrugarh, also engaged in carpentry; one in Sylhet, a goldsmith, and one in Jorhat. As regards the work of carving, there is little that calls for remark. The ivory as procured in generally in a fit state for carving at once. In some places it is put in boiling water and milk before it is cut up, while in Manipur it is cut up and then put in the shade for a considerable time until thoroughly dry. The tools used for carving are practically the same as used in wood carving,—saws, chisels, and borers of various sizes, used according to the nature of the work. Tools, both of European or native manufacture, are equally used. For the final polish there are various articles. There is, of course, sand-paper (*siris kagoj*), the use of which is general. The scales of the *pithia* fish is also used; this fish is not in great request or favour as an eatable, but its large scales are very useful

for polishing purposes. In Manipur the leaf of the "Heitmana," or jungly fig, is employed; the surface of this leaf is very rough, and acts as a fine sand-paper. Husks of paddy and leaves of the jack trees are also used, but to a small extent.

The nature of the articles turned out depends on the demand. Practically, the whole of the work done is the result of special orders, and generally any article ordered can be executed. The representative of the industry in Sylhet makes a speciality of fans, while the Jorhat worker has a preference for salad spoons and forks and back-scratchers. The latter carver, however, confines himself slavishly to these three articles, and will not execute orders for other than these. Small boxes, paper-knives, dice, chessmen, combs, handles for knives, umbrellas, etc., bracelets, rings, and models of animals represent the general nature of the work.

In these articles there is generally some ornamentation. Figures of animals, as elephants and fish, and drawings of creepers and flowers, are common objects of ornamentation. Rubies and emeralds of a cheap nature adorn many articles, as spoons, forks and bracelets, and are used for eyes in the case of animals. Silver, gold, and brass, too, are occasionally employed. In Fiznur's case, there is little or no variety in the ornamentation.

The value of the ivory in its original state varies according to quality. Good ivory generally fetches from Rs.12 to Rs.15 per seer, while inferior ivory may not fetch more than Rs.5. In the Garo Hills any ivory found or brought in is sold to a contractor at a fixed rate of Rs.9. good and bad. The ivory exported to Calcutta and sold there generally fetches a much higher figure.

The value of the finished article depends (1) on the amount of ivory required, (2) the value of the ornamentation, (3) the time required to carve the article. The ornamentation generally amounts to a very small proportion of the final cost, rubies used being worth but Re.1 per hundred. For his labour the ivory carver generally charges Re.1 per day. To illustrate this, we may take the salad fork and spoon, the work in which the Jorhat carver excels. The ivory required in this will cost from Rs.20 to Rs.24. The rubies used in its ornamentation would cost Rs.5 to Rs.12; (this figure seems to me rather high, and the carver, I think, must make a considerable profit on this). The sale price of the fork and spoon varies from Rs.30 to Rs.50. Taking his value of the stones, this gives him on the average a sum of Rs.14-8 for his labour, which in this case covers a period of 13 to 15 days. A day's labour, however, covers but few hours.

There remains little more to be said. Ivory carving once flourished because nurtured, and, as I have pointed out, because not altogether an optional industry. It decayed when both these influences ceased. It has now reached the point of extinction, not so much because there is no demand, but rather because the workers, from want of energy or material, have so hidden their talents, that but few know of their existence.

IVORY CARVING IN BURMA.

By H. S. PRATT, Esq., I.C.S.

The origin of the ivory carving industry in Burma is wrapped in obscurity. The ivory carvers of that town assert that Moulmein was the first town in Burma in which carving in ivory was practised, and one of them, Saya Ko Shwe Ko, who still plies his craft, claims to have been the first exponent of the art. He commenced working in ivory about 30 years ago at the request of some Shan timber traders from Kado, who were desirous of having images of Buddha carved from tusks in their possession. Although he professes to have been self-taught, it is improbable that he evolved the art entirely from his own brain without any models to guide him. The descendants of a well-known rival of his (Saya Nyein) who died some years ago, trace their craft back to their uncle, which would tend to show that ivory carving has been practised in Moulmein for a longer period than thirty years. At Pyinmana ivory carving, though in a cruder form than in Moulmein, is known to have been practised before the annexation.

It is related in the Buddhist legends how, in one of his existences, Gautama Buddha took the form of an elephant and was known as Sattan Sin Min. His consort, Sula Batta, being under the impression that she was slighted by her lord, prayed that in her next existence she might have vengeance upon him. In course of time she passed into another existence and became Chief Queen of the King of Benares. To heal her of an illness, which she feigned, she caused it to be declared imperative that she should wear an ivory earring. A celebrated hunter, Thawnuttaya, was accordingly despatched and succeeded in obtaining the tusks of Sattan. From that time forth working in ivory came into vogue.

Another legend narrates that in 470 B.E. Along Cithu, King of Pagan, on his return from a journey to Ceylon and various parts of India, saw a huge white object near the sea-shore. On approaching he perceived it to be a mound of ivory, which a gigantic centipede had erected for its residence. Such was the size and strength of the monster that it was in the habit of catching and devouring elephants, the tusks of which it used to form a wall around its place of abode. Taking advantage of the opportunity when the centipede was away in search of food, the king carried off the tusks and had them carved into images to add to the attractions of his palace. The legitimate inference from these traditions would seem to be that the Burmese have long been familiar with working in ivory, and that it was introduced from India.

So far as can be ascertained, the only towns in which ivory carving is now practised are Moulmein and Pyinmana. The art formerly had a footing in Rangoon, but the only remaining carver known has ceased to exercise his profession, and when an order is placed with him, engages a workman from Moulmein. It is supposed that most of the other carvers have left Rangoon for Moulmein, where the occupation is more remunerative, or adopted other professions.

At Pyinmana, though ivory is procured without difficulty, owing to the large number of elephants in the neighbourhood, it is reported that there is only one ivory carver worthy of the name. The industry there is stationary and is said to have been in the same condition before the annexation. Some of the work is fairly good, but is not to be compared with that done in Moulmein. The latter town may therefore be said to be the centre of the ivory carving industry in Burma, and even there it is not practised on a large scale, three families only being engaged in the art.

The industry has been aptly compared to our English cottage industries, affording a pleasant livelihood and giving a sufficient income without unduly hard work. The craft is handed down from father to son and reminds one somewhat of the conditions that prevailed in mediæval times. The craftsmen and apprentices are grouped round a master, under whom they work and who gives his name to their productions. The art is rigidly confined to these groups, and every precaution is taken to prevent outsiders gaining a knowledge of the craft and adopting it as a profession. Given the requisite natural aptitude, an ivory carver can be trained in three years.

Prospects of Development.—There are no signs of any immediate expansion of the industry, and those engaged therein say that little or no carving is done as compared with ten or fifteen years ago. This statement is, however, in all probability an intentional exaggeration. The ivory carvers are very jealous of their profession and reluctant to give any details as to the method of working or the income obtained therefrom. Within certain limits the profits derived appear to rest almost entirely with the artist himself. It is believed that the ordinary income of a master-carver in Moulmein is about Rs.600 a year, but there is little doubt that he could considerably increase his earnings if he were so disposed. It is not, however, the way of the Burman to over-exert himself so long as he has sufficient to meet his needs, which are not great, and a slight surplus to devote to objects connected with his religion. Although the ivory carvers themselves say the demand for their work has fallen off in recent years, the report received from Moulmein shows that there has been a slight increase in the number of persons employed in the industry. All the carvers have as much work as they can do, in fact, almost more, and take a long time to execute orders, pleading press of work as an excuse for delay. There is thought to be ample scope for a considerable number of carvers in addition to those already employed. It is suggested that the opening of a school of art might give an impetus to the industry.

Influence of Imported Articles.—The proportions of the industry are so insignificant that it is not touched by foreign competition. Articles are not manufactured in anticipation of the demand, but solely to meet orders received. The only way in which imported articles exercise an influence is when purchasers order articles to be made according to western models.

Source of Materials.—At Pyinmana elephants are plentiful and there is no difficulty in obtaining as much ivory as is required. In Rangoon the small quantity required is procured usually through the agency of the ubiquitous Chinaman at a price varying from Rs.17 to Rs.22 per viss. In Moulmein the ivory is procured chiefly from Shan traders and occasionally from the local timber mills, or the Commissariat Department when an elephant

happens to die or break its tusks. The cost there is about Rs.17 a viss for small tusks, but is higher proportionately for large specimens. The price is said to have risen considerably in recent years. The total amount of ivory used in a year by the Moulmein ivory carvers may be estimated approximately at from eight to twelve pairs of tusks.

Method of Working.—The carver himself designs and draws his patterns, which are usually of the conventional Burmese type, unless copied from European models by the direction of the purchaser. Family patterns are preserved and handed down. The following account of the processes employed is based on the description given by an ex-ivory carver resident in Rangoon. The tusk is first cut to the required shape and size with a *da*, saw, or axe, as the case may be, and then smoothed by the application of a file. This done, the required design is sketched in pencil on the surface of the ivory. Holes are next made with a small gauge, which is hammered with a deer's antler when necessary. Particular stress is laid on the point that only deer antlers are used. Iron and wooden hammers are respectively too heavy and too light. If a wooden mallet is used in carving, being soft and light, it will not have the desired effect on the ivory. Iron hammers, on the other hand, being hard and heavy, there is great danger of the work being spoiled if they are used. When the requisite number of holes has been made the ivory is rough-carved according to the designs already sketched. The tools used in this operation are gauges, flat chisels, files and drills of different sizes. The next process is smooth carving. This requires great care and delicacy of touch. The instruments generally used are small chisels, files, drills and gauges. No mallet or hammer is used except when absolutely necessary. After the carving of the outer framework has thus been completed, the figure inside the casing (assuming that this style of work is chosen) is carved in the same way. When the whole carving has been completed to the satisfaction of the artist, and the finishing touches added, it is smoothed by the application of fine sand-paper. It is then given a polish by being rubbed with paddy-husk washed with soap, and finally dried in the sun.

This account conveys a very inadequate impression of the patience, skill, and delicacy of touch required to achieve the results attained by the artist. It is almost impossible to convey in words any idea of the way in which, with his small iron instruments, flattened and sharpened at the end, somewhat after the fashion of a miniature screw-driver, the carver chisels out the interior of a block of ivory into a figure, which is most faithfully and accurately portrayed to the smallest detail, and yet at the same time leaves it surrounded by a frame of open work, or causes it to join and blend with the encasing framework, and so combines the two with the most happy result, or again leaves an opening in the enclosing frame and discloses a sitting image of Buddha in a miniature shrine. The work must be seen to appreciate it fully.

Owing to the fragile nature of the materials used and the extreme care and delicate handling required, the apprentice is not allowed to use ivory for his first attempts. Till he has attained a certain degree of skill, the master gives him to practise with a cocoanut shell, which is more brittle than ivory, and therefore demands even more careful handling. When the master thinks that his pupil has attained sufficient proficiency, then only is he allowed to experiment with ivory.

Tools.—The instruments used are very simple and consist of *das*, saws, files, drills, chisels, clamps, and an axe for rough shaping large articles. Most of these are locally made, and those which are not made locally are purchased in the bazaar. The carver as a rule make his own clamps. The smaller chisels are said to be pieces of umbrella ribs sharpened on a stone.

Articles Manufactured.—The chief articles made are handles for *das*, knives and forks, and paper-knives. From big tusks boxes, picture-frames, and similar articles are carved. Chess-men, mats, chairs, &c., are also made to order. For Buddhist purchasers images of Gautama Buddha are carved. In Rangoon carved tripods for supporting bowls seem most popular. Whole tusks are frequently covered with carving for use as ornaments. One pair (of which, unfortunately, no photograph could be procured) was decorated with no less than 28 statues of Gautama, and gave employment to an experienced artist for between seven and ten months.

The Artistic Side.—The style of the carving is that known as Burmese. The figures are treated conventionally as in wood carving and silver work. Even where articles are made after European patterns, they are still executed in the conventional Burmese style. The scroll work and flowers do not call for special remark. Attention has already been drawn to the great skill displayed in carving the inner design, surrounded as it is by a casing of delicate tracery; this is a favourite device, the figure within being quite distinct, although carved from the same block as the outer envelope. Unfortunately this is but imperfectly reproduced in a photograph, and it is only by inspection of actual specimens of carving that the nature of the design can be fully realized.

In the absence of other ivory work there are no materials for instituting a comparison, and it is very difficult to accurately weigh the merits of Burmese ivory carving from the artistic point of view. The finish is possibly not so good as in Chinese and European carving, and the polish is probably less fine. There is a lack of originality in design, and little art in the creative sense is exhibited. If, however, art consists in accurate and succesful imitation, then in this sense it is displayed in a high degree.

It is in the skill and ability exhibited in the execution of the work, in spite of the comparatively simple instruments at the disposal of the artist, that the chief merit of Burmese ivory carving is undoubtedly to be found. Although originality and creative genius may not be conspicuous by their presence, the delicacy of touch, the close co-operation of hand and eye, the elaboration of detail, and the fidelity with which the design is reproduced, all contribute their share to the general artistic effect, and it is here especially that scope is given for the development of individual talent.

LIST OF ILLUSTRATIONS.

80, 81, 82. Tools. 83. Combs, Knives and *Surmadanis*. 84. Toys, and Chúrigars at work. 85. Furniture. 86. Comb, Paper Knives and Spoons. 87. Ivory Carving (Bhúj). 88. Burmese Ivory Carving.

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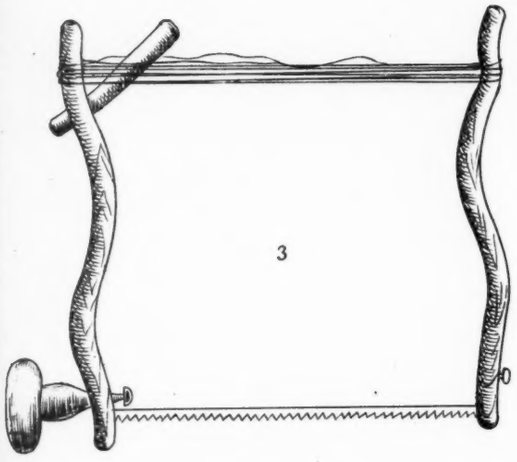
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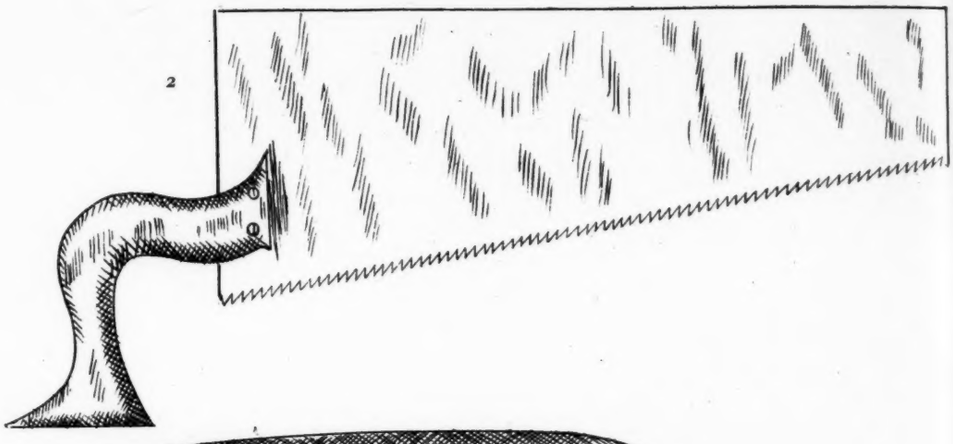
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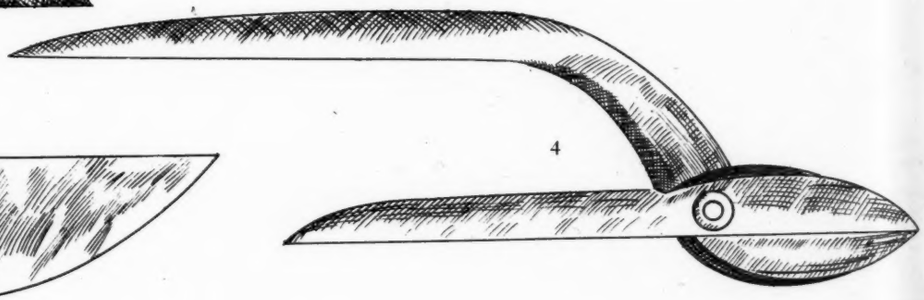
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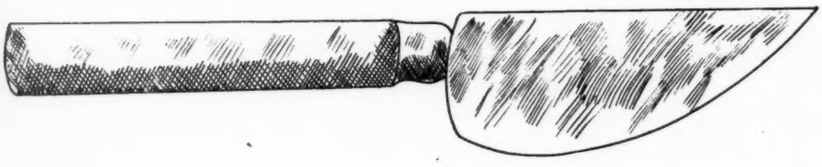
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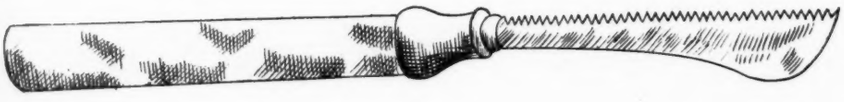
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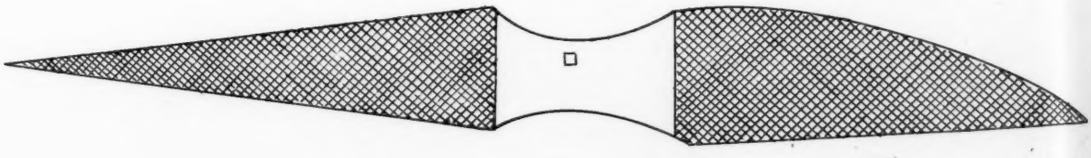
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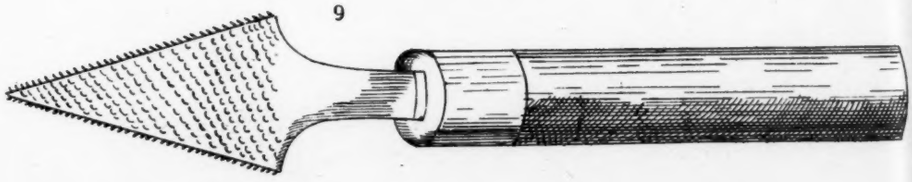
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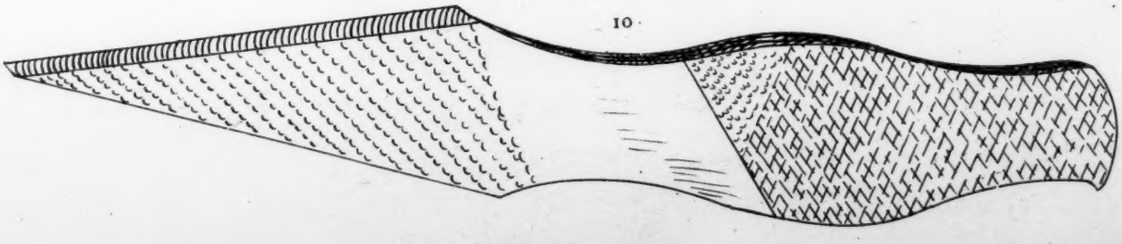
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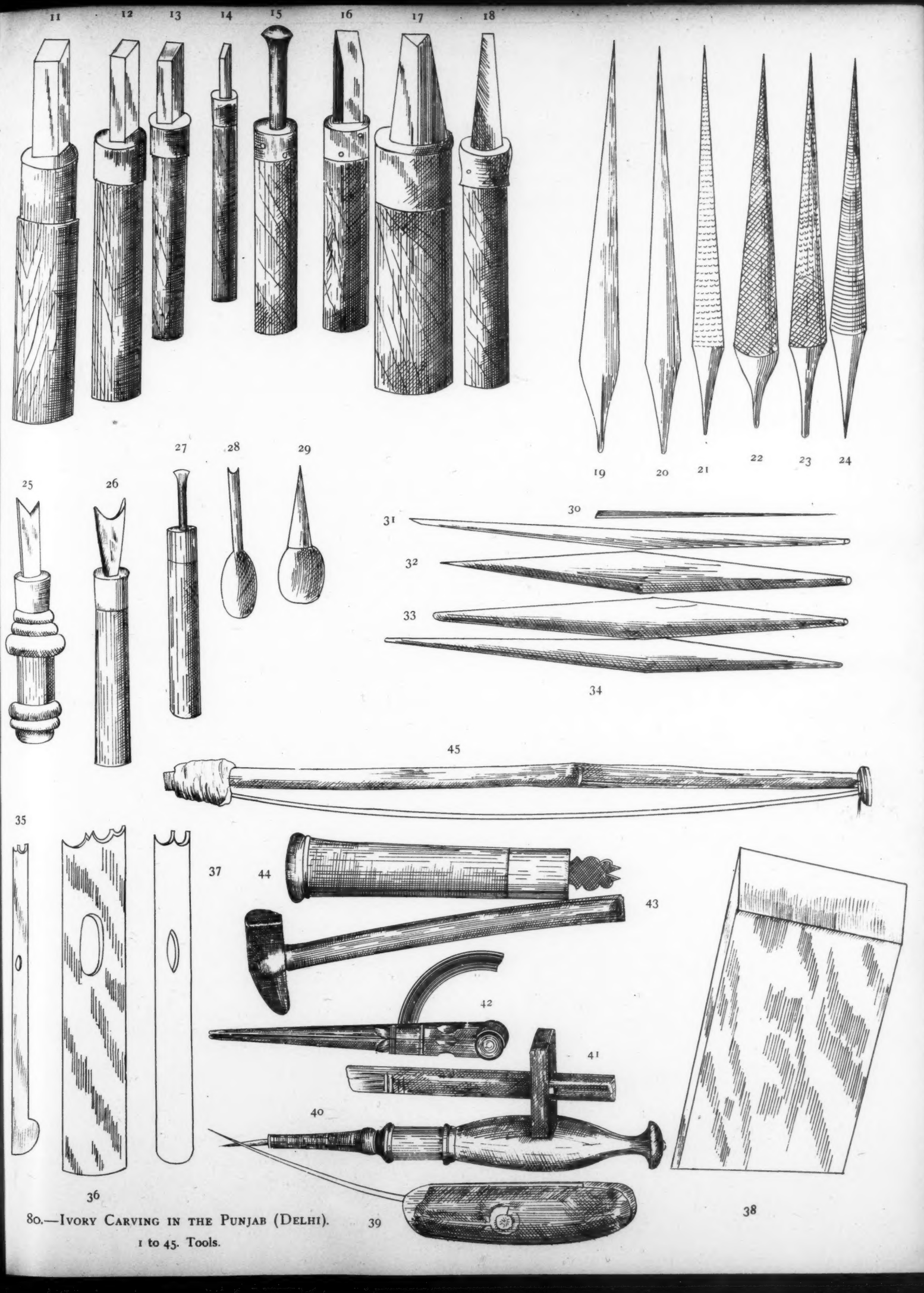
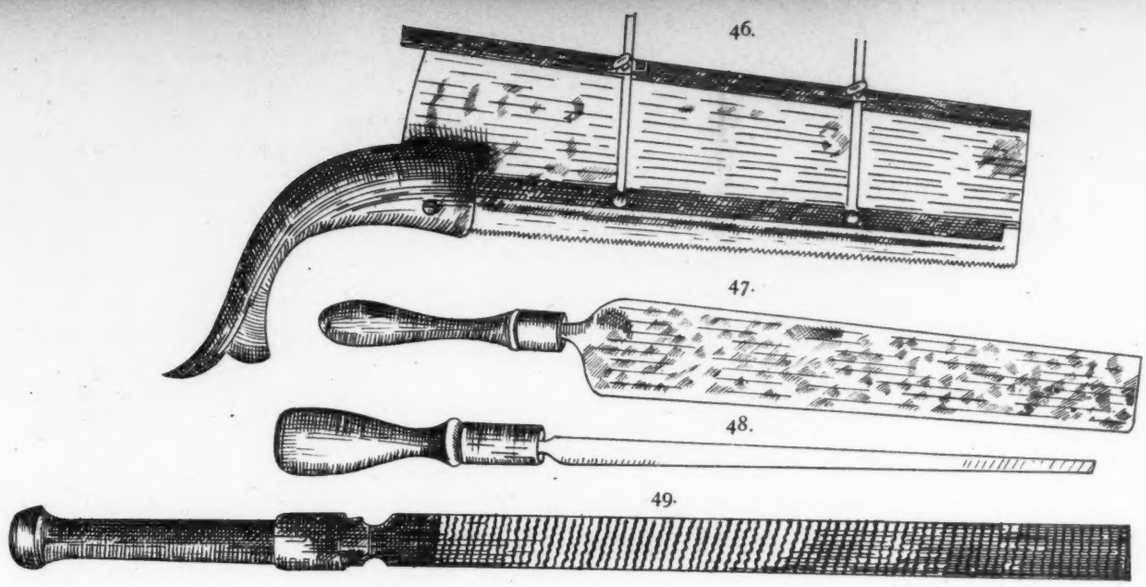


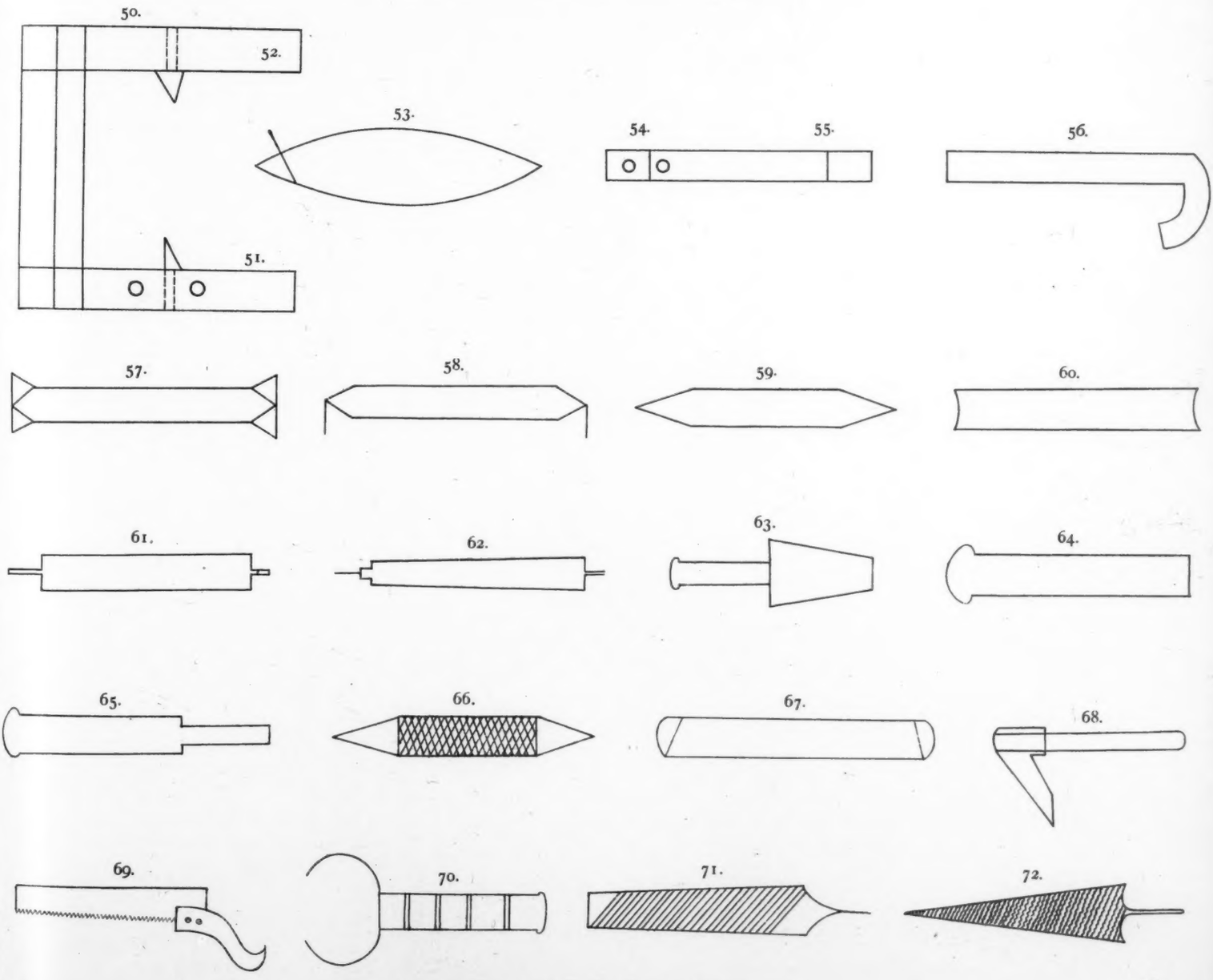
80.—Ivory Carving in the Punjab (Delhi).

1 to 45. Tools.



TOOLS USED IN COMB MAKING (AMRITSAR).

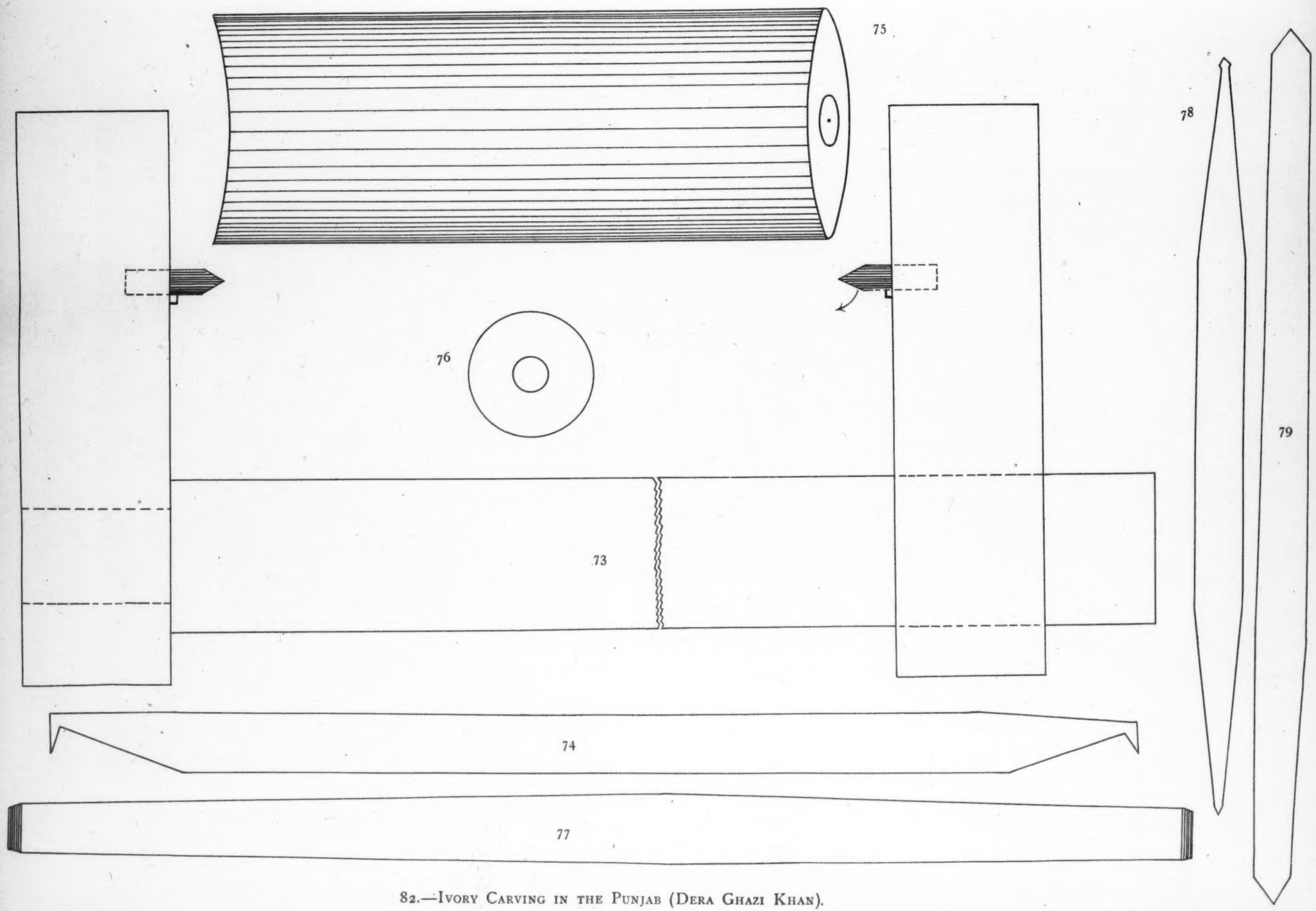
46. *Ari* or Saw. 47. *Patal.* 48. *Thasul.* 49. *Rethi.*



81.—IVORY CARVING IN THE PUNJAB (LUDHIANA).

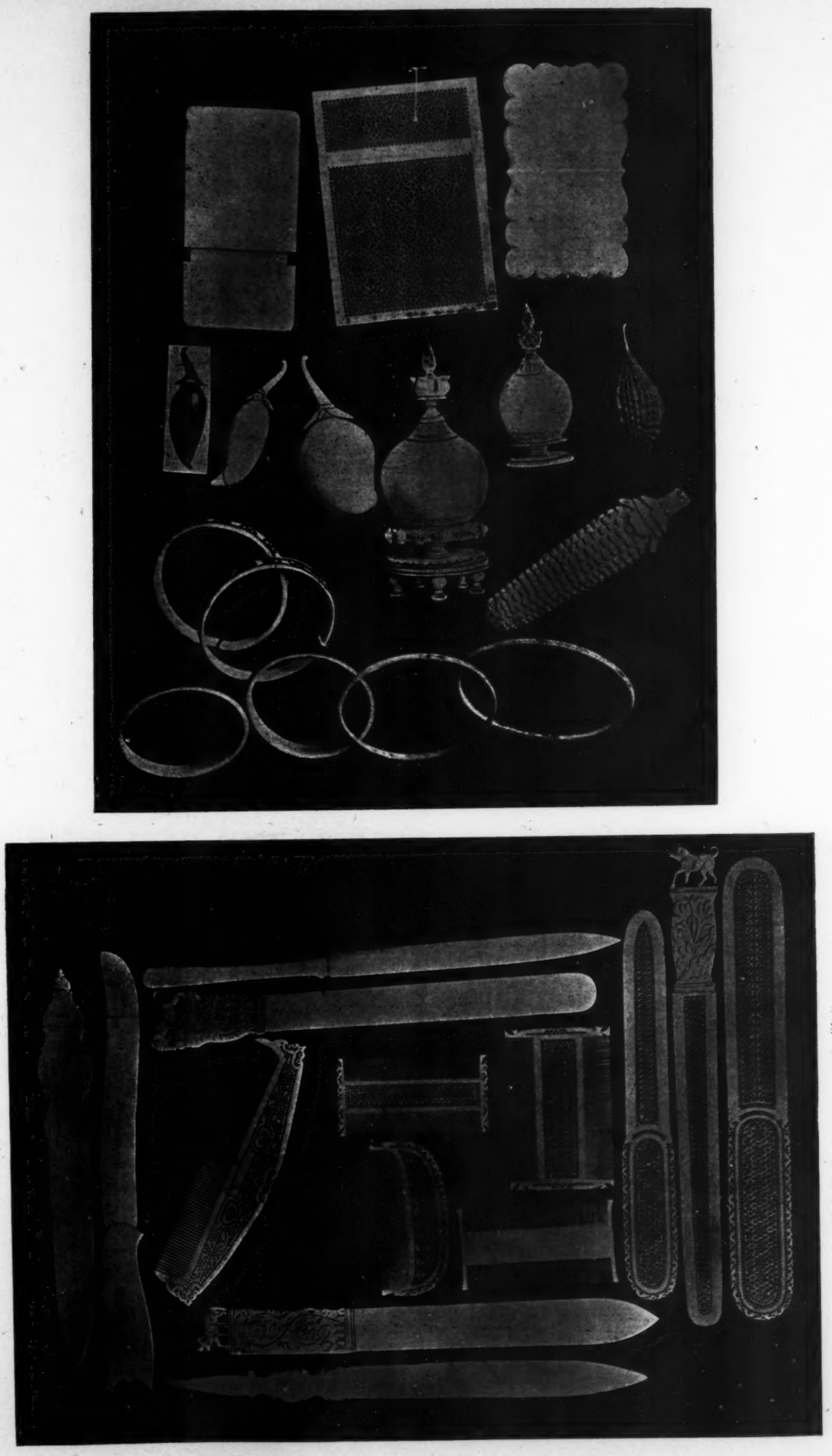
TURNERS' TOOLS.

50. *Jand.* 51. *Kanda.* 52. *Sua.* 53. *Kamána.* 54. *Subbal.* 55. *Dhur.* 56. *Loha rach.* 57. *Mathni.* 58. *Singari.* 59. *Chírna.* 60. *Rangwata.* 61. *Kher.* 62. *Verma.* 63. *Kalbút.* 64. *Bambia.* 65. *Tíra.* 66. *Rachi.* 67. *Roda.* 68. *Tesha.* 69. *Ari.* 70. *Chari.* 71. *Rethi.* 72. *Tikera.*



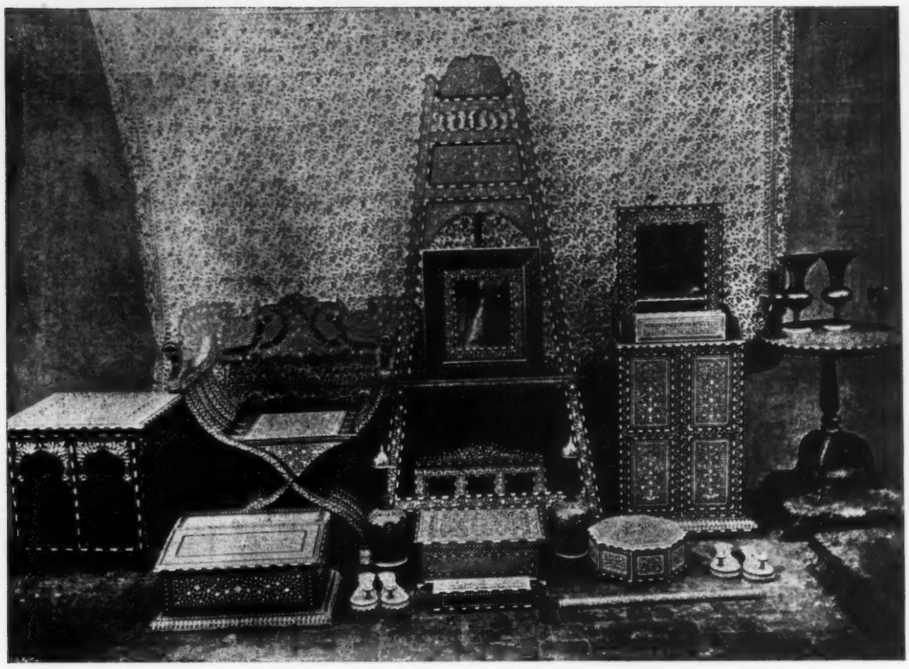
82.—Ivory Carving in the Punjab (Dera Ghazi Khan).

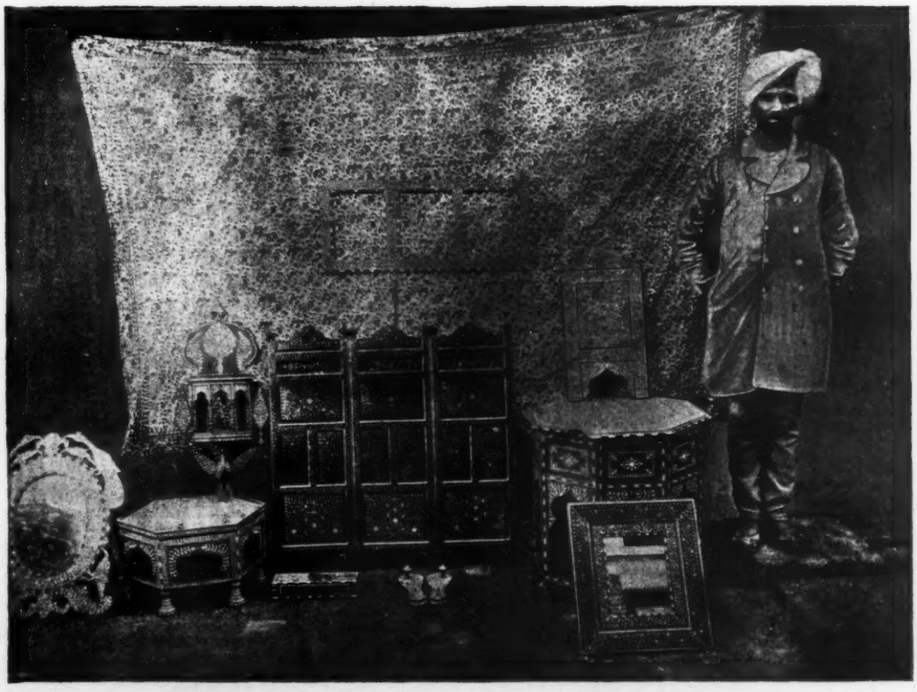
73 to 79. Chúrigar's Tools.



83.—Ivory Carving in the Punjab (Amritsar).
Combs, Knives and *Surmadanis*.

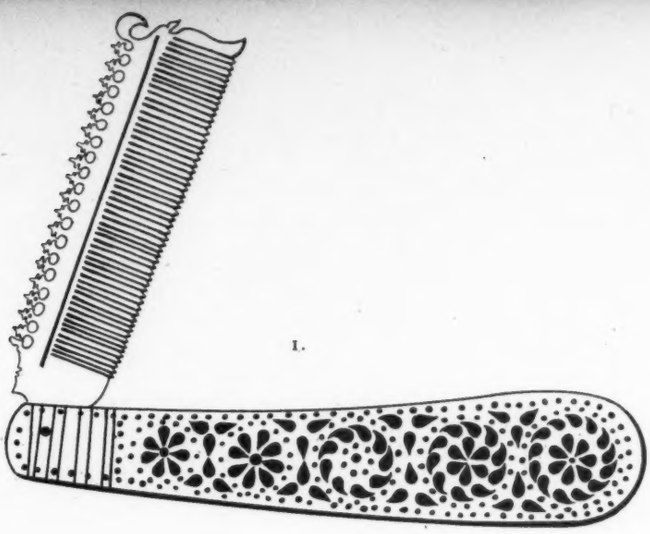
84.—Ivory Carving in the Punjab.
Toys, and Chúrigars at work (Amritsar).





85.—Ivory Carving in the Punjab (Hoshiárpur).

Furniture.



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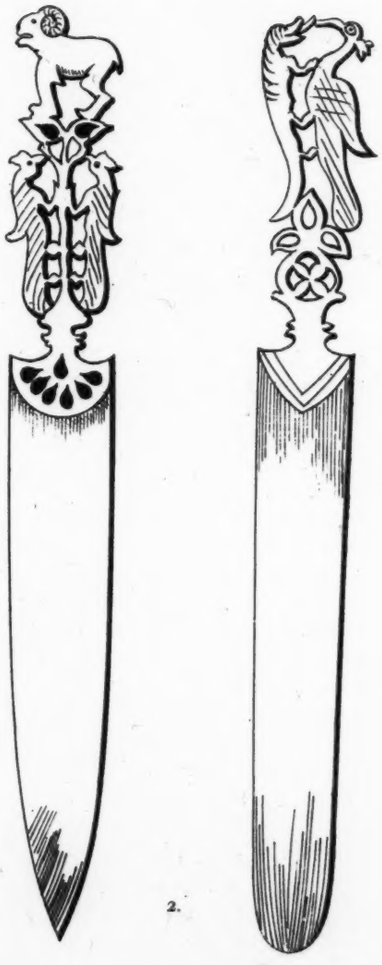

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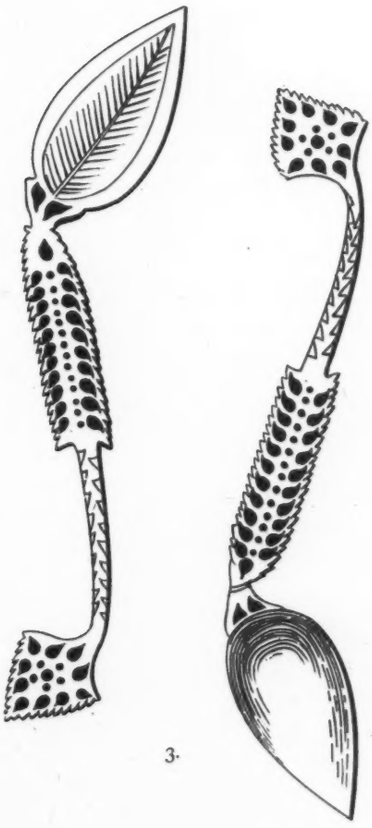

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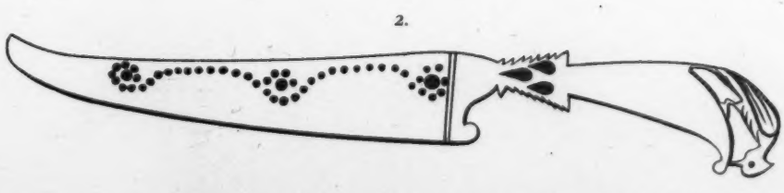

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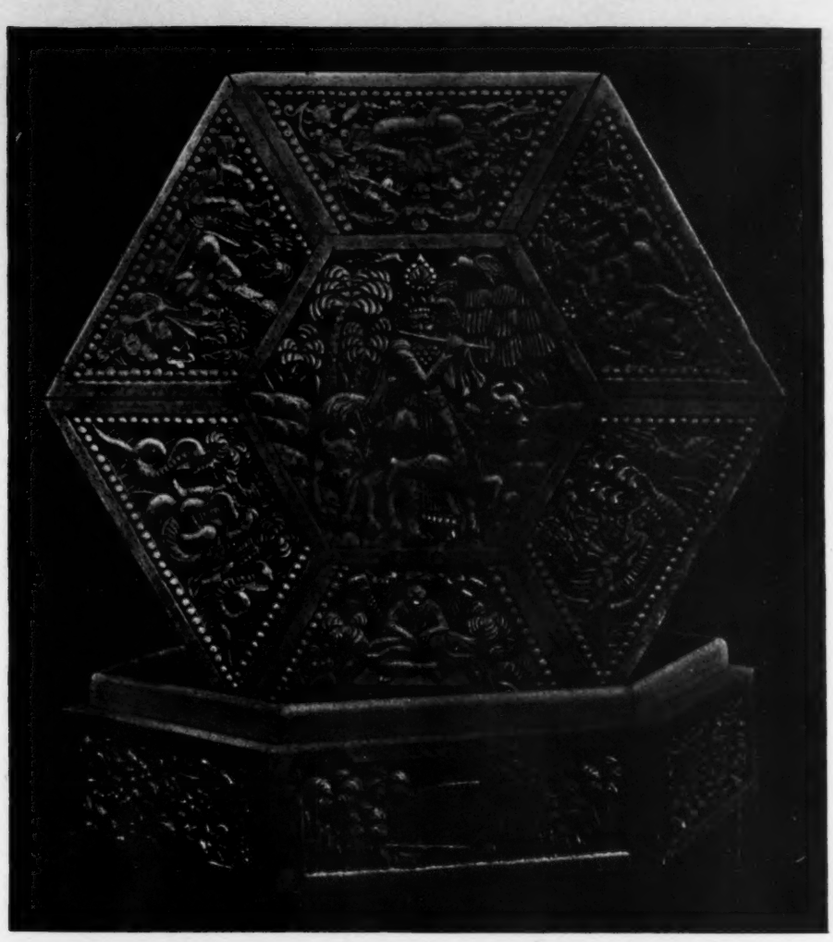
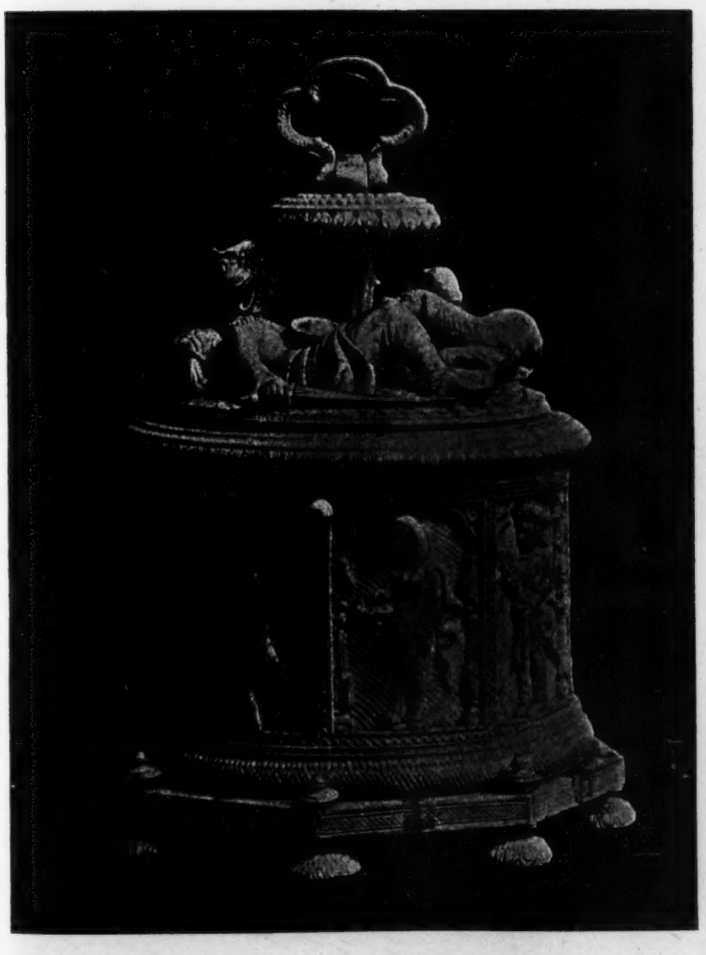
86.—Ivory Carving in the Bombay Presidency.

1. Pocket Comb. 2. Paper Knives. 3. Spoons for adding water to ink.





87.—Ivory Carving in Bombay Presidency (Bhúj).

88.—Burmese Ivory Carving.

The Journal of Indian Art and Industry.

GLASS MOSAICS OF BURMA.

By HARRY L. TILLY, Esq.

UNDER the Burmese Government the sumptuary laws were enforced against commoners not only in respect of dress, but in all the transactions of life, including even the words used in everyday speech. The honours thus accorded to the Royal family were shared by the community of monks, and as in many another country, the art handicrafts were matured in the Palace and the Monastery, where alone might the genius of the workman find unrestrained expression. The people, bound down as private persons, were, as patrons of the monks, able to indulge in the lavish display allowed to royalty alone, and while placing their earnings out of the reach of even official rapacity, were at the same time enabled to earn religious merit by obeying those precepts of the Lord Gaudama which inculcate the building of pagodas and monasteries, of shrines and of rest-houses in which to observe the eight-day fast.

And now the sumptuary laws have been swept away by the advent of the British, the old customs, strengthened by years of precedent, still hold sway, and with rare exceptions are observed by the people, who still refrain from using the once forbidden forms and materials for their private gratification.

The national characteristics of the Burmese are well expressed in the construction and decoration of their religious buildings. A laughter-loving nation, impulsive with quick genius, yet reverent where reverence is due, they love flowing lines and ornament exuberant with vitality, but are careful to form the framework of their structures on principles handed down from one master to another with all the authority of the past. And it is well that this should be so, for the old proportions are pleasing to the eye, and whether it be boat or pagoda, cart or shrine, each part is well placed and fitted for the work it has to do. If Burmese ornament be contrasted with that of a kindred nation, the Chinese, its peculiarities are made clear. Chinese work is orderly and restrained; the ornament is used to emphasize the construction, and the subdivision of the main divisions is carefully marked and is in good proportion. With the Burmans there is no restraint, and, except in the oldest examples, there are no plain spaces to rest the eye and the brain, nor is the wealth of intricate detail rendered clearer by the recurrence of intertwined patterns. The ornamental parts are attached after the structure is complete, and hide rather than explain the construction.

The general effect produced by the best examples is of beautiful outlines and elegant exterior proportions: but there enjoyment ceases; and the admiration, at first excited, is slowly changed to weariness at the disorganized jumble of items, each good in itself, but with no relation to its neighbour, and but little to the work as a whole.

It is curious, therefore, to notice how these characteristics of Burmese art are modified and changed when the handicraftsman has to deal with mosaics in which spaces, lines and patterns cannot be ignored. It is not an art indigenous to Burma, but was introduced from Siam after an invasion of that country by Naungdawpaya, son of Alaungpaya, and to this day some of the best masters of the craft are Shans, whose colour sense is more highly developed than that of the Burman, and who have some of the instinct for the division of spaces which characterizes the Chinese.

It is on the platforms of the pagodas in Lower Burma that the best examples of Burmese art are found, and chiefly on that of the Shwe Dagôn Pagoda at Rangoon, where pious Buddhists have for centuries lavished their riches. This, the most important shrine in Burma, is approached between two grim dragons and up many flights of covered steps, at each side of which are displayed on stalls, candles, paper praying-flags, flowers, incense sticks, toys, masks, song-books, cheap jewellery, and many other things calculated to attract the attention of people from the jungles. The light, slanting between the pillars at the sides, reveals in softened hues the bright colours worn by the worshippers who pass silently with bare feet up and down, or pause at the stalls. When the topmost step has been reached, the last and most gorgeous flower-stall has been passed and the platform gained, the eye looks across the widened vista, but does not rest until it reaches the highest point of the tapering gilded mass which arises in seeming confusion from the platform below. After gazing awhile at the glittering *ti* fixed against the shifting clouds, the glance descends again towards the base and is attracted by candles in a dark shrine close at hand, from the gloom of which twinkle stars of light, many coloured, and flickering as the flames waver in the wind. These are reflections caught from glass mosaics on pillar and altar, on the image and on its throne, on the ceiling and on the wall.

There are four principal shrines at the base of the pagoda, each facing a cardinal point and all decorated with glass mosaics. Those to the north and west are more elaborate than that opposite the south entrance, but before examining them it will be well to consider the group of pagodas and shrines found in the south-east corner of the platform, which are represented in Plates 89, 90. The mast with a fluttering peacock at its head carries streamers on which are written extracts from the Law of Buddha. The mast itself is encrusted for its whole length with mosaics in regular patterns, relieved here and there, but in unexpected places, with dividing rings. To the right in Plate 89 is a pagoda of singularly ungraceful shape, but the upper portion is covered with looking-glass mosaic which causes it to flash like dull silver against the palms behind. In front of this pagoda is a shrine which is best seen in Plate 90; it is made of masonry, and the whole of the front portion is glass mosaic set in cement.

Another example not far off is shown in Plate 90. An alabaster image is seen seated on a throne adorned with glass mosaic, while the background of the recess is of the same material. The whole of the front of the shrine is similarly ornamented. The upper portion of the exterior work consists of bold and effective scrolls placed on a bed of narrow slips of plain looking-glass. White glass is also the chief material used in the foliage work where there are occasional leaves of purple, of green and of a dull orange. The background of the pillars is in dark green on which are crimson stars and purple ornaments.

Passing along the platform, the main shrine at the base of the pagoda facing east next attracts attention. Taken as a whole, it is perhaps the most perfect example of Burmese art in the province. The many-roofed spire tapers above; each gable and pinnacle is in just proportion, the dark carving standing out against the roof and relieved by the red and gold of gable end and walling, while all is supported on massive round posts, vermilion near the base and encrusted above with silvery glass mosaic. Plate 91 shows the lower part of this shrine and a few Shans from the jungle. Glass mosaic is also used on the screens between the pillars, which are singularly effective.

The shrine facing the north has been pulled down and a new one is being built. In the pillars the ground colour is dull green, while the stems of the tendrils are white and the leaves in purple and orange; the whole being interlaced with a purple geometrical pattern, while a gilded line outlines each colour. Plate 91 shows the shrine finished. Inside, next to the pagoda, is a recess of very old date in which is a figure of Gaudama thickly encrusted with gold leaf and before which candles are burning. Along a wall which is more forward than the recess, but railed off, a number of images are placed, some of brass and some of marble, and many clothed with a robe of yellow gauze. On the top of the rail is another row of candles and these can be seen in the plate. Before these are flowers in jars—amherstia, frangipani and cannæ; worshippers seated with upraised closed hands mutter fragments of the law in Pali. The pillars are all covered with mosaic above and gilded below, the work intertwining in three planes. The colours of the outer pillars have been described before; the inner have a ground-work of blue and the pattern, in a conventional scroll—almost geometrical, is in green with a few buds of glass diamonds surrounding a ruby. The narrow strips outlining each colour are gilded. Above all is the ceiling, which follows the slopes of the roof except in the centre. It is in large panels of looking-glass arranged in star-like facets, divided into concentric squares or ovals by a border of bluish-purple flower scroll work, the edges of which are lined with gold. These ceilings are broad in effect, being of many different slopes; the light on the glass is not uniform but varying, gleaming here and there; but from the darker portions points of flashing light appear. The gilded portions, too, appear sometimes brown, sometimes golden in colour. In the centre the ceiling is more elaborate, and is shown in Plate 92.

The star-shaped facet-work generally used for ceilings is shown in Plate 92. It has been employed here to cover the back wall of a shrine, and on it has been imposed the figure of a *galon* or winged man, holding a writhing chain of *nagas*. From this plate a faint idea may be gained of the effect of using glass mosaics on the frontlet and embroidered edges of the robe of a figure. Although the artist has not quite succeeded, there is much in this work which appeals to the imagination. The contrast between the placid image and the horrid snakes is heightened by the smoothness of the alabaster against the rough glass background and by the pure dead white of the image against the gleaming facet-work in which is reflected the trees outside and red and green light cast through a coloured window over a doorway facing the image.

Continuing round the platform from the north shrine to the westward, an old giant *padauk* tree is seen, and around its trunk are masonry recesses, recalling those on the face of the cliffs at Ywataung, in which sit images of Gaudama placed there by devotees long since dead. In front and blocking them from view, save where the spires taper away, are modern shrines of brick, some in the conical Burmese shape and some in the square style of the Shans. Plate 93 shows one corner of the group. The chief effect is that of gold picked out with vermilion, though in some the vermilion predominates, but all the lower portions are elaborately decorated in

glass mosaics. Behind the barred doorways the alabaster images sit on the usual glass throne, and behind, through the gloom, glimmering points of light suggest a glass background. It is curious to notice that, though the buildings are in shadow, the white jackets and coloured silks of the passers-by are reflected in waves of light, giving to the immovable buildings the appearance of movement and bringing to mind the rhythmic play of light on a diamond necklace. Plates 93 and 94 show some of these shrines in greater detail, with the monsters that guard the doors.

Some good examples of old mosaic work are shown in Plates 94 and 95. The altars or thrones seen in the former are simply effective in design and compare well with the unmeaning design shown in Plate 93, and is preferable to that on Plate 92. There is less handwork and more headwork in the old design, and the result is much more satisfactory as a work of art. To the right of Plate 94 is a stand for an impression of the footprint of Gaudama Buddha, wherein the symbols of all his previous existences are depicted. This, too, is an excellently quiet and appropriate piece of work.

The box surmounted by a small shrine, shown in Plate 95, is one of those used to keep manuscripts in, and came from a monastery in Upper Burma. The colours employed are dull green and lead colour, relieved here and there with a sober red. On the same plate is a view of a shrine, not quite finished, on the western face.

Material used in Glass Mosaic Work.

Glass.—(*a*) *Backed with quicksilver.* Glass plates of different colours are well cleaned and dried. Mercury is poured over a foil of an alloy of tin and lead and the foil placed at the back of the glass and, after being sprinkled with fine ash, is squeezed with a cloth roller until it is perfectly even and smooth. The foil is removed from the glass, which is kept flat for a day and upright for another day. A thin piece of paper is then pasted over the coating and the glass is ready for use. It is cut into the required shapes with a glazier's diamond. (*b*) Very thin glass is treated in the same way and is cut into small squares with a diamond; the corners of the squares are snipped off with scissors; the edges are left jagged unless required for fine work, when they are bevelled off on a stone-cutter's wheel. These small octagons are used in bordering and in making patterns. (*c*) Glass with a tin-foil back. (*d*) Imitation diamonds.

Varnishes and Resins.—(*a*) *Thit-si.* The best is obtained from the Shan States and costs Rs 2-8-0 a viss. (*b*) *A-young-tin Thit-si.* The common quality made in Burma. (*c*) *Shan-si.* An oil extracted in the Shan States from sesamum.

Sundries.—(*a*) Vermilion, the Chinese kind. (*b*) Ashes of cow-dung and bones, finely sifted. (*c*) Saw-dust. (*d*) Paste made of glutinous rice.

Preliminary Preparations.

Putties.—(*a*) The putty used in coarse work is made of saw-dust mixed with *thit-si* and well pounded in a mortar. (*b*) Putty used in finer work is made by boiling *thit-si* and stirring it until it gives out a slight crackling sound, when it is sprinkled with water and allowed to cool. It is then thoroughly mixed with cow-dung ash and beaten on a block of wood with a stick, ashes being added until the right consistency is obtained. It must be used when fresh and before it hardens. This putty is formed into a long string about one-tenth of an inch in diameter and is slightly powdered with fine ash. Ornaments are made of it which are afterwards applied to the work with resinous glue (*thit-si*), or the putty is applied to the face of the work and patterns formed partly by the manner in which it is laid on, and partly by being moulded with a knife.

When ornaments are made in the workshops, the design is first engraved on slate over which fine ash has been sprinkled, and the ornament is moulded to the pattern and taken off to set.

Processes.

Preparation of the Surface.—Glass mosaic is generally affixed to the plaster of masonry. Coarse saw-dust putty is laid on the plaster until an even surface is obtained, when it is coated with *thit-si* and allowed to dry. The surface is then rubbed down with a smooth stone.

Drawing the Pattern.—A card-board stencil is prepared in the workshop, and all the different coloured glasses are cut to shape there. The pattern is then marked on the prepared surface with powdered chalk.

Fixing the Glass.—The glass, ready cut, is placed in a bamboo tray, and the workman picks them out, and putting some saw-dust putty on the back, presses the glass with his thumb into the required position; he is shown doing this in plate 91. He does this with one colour at the time until the pattern is complete. Cords of putty are now placed between each piece of glass and they are carefully cut and moulded with the knife so that the finished pattern may be accurate and in flowing lines. The whole work is then coated with *thit-si*, which is allowed to dry. The parts which are to be gilded (that is, the tracery of dividing lines) are painted with a coating of vermilion and Shan *thit-si*. When this is dry the glass surfaces are cleaned and the parts to be gilded are again painted with a very thin layer of *thit-si* and gold-leaf is applied.

MODERN INDO-SARACENIC

(SANDEMAN HALL, QUETTA).

By IVIE HAMILTON, Esq.

In Volume I. of the *Journal of Indian Art* it is said :—"More, perhaps, has been done by Colonel Jacob to prevent the degradation of Oriental architecture by a practical illustration of its beauties in modern buildings, than any other official." It is now proposed to give an illustration of one of Colonel Jacob's designs, which was erected at Quetta, the capital of Baluchistan.

Sir Robert Sandeman, the Agent to the Governor-General, was on a tour in Southern Baluchistan, when he contracted influenza and died at Las Bela on the 29th January, 1892. I was at Sibi when the sad news was received, and never shall I forget a stroll that afternoon through Sibi bazar with Major Temple, who was then Political Agent at Kalat. An Indian bazar is usually a mass of busy and lively humanity, resembling a swarm of bees, but the effect of the news was soon apparent. Instead of the free and rapid movement of individuals, there was a restraint pervading the atmosphere. Men walked about slowly and were congregated in groups, the usual sounds were hushed, and the people were reverently discussing in knots of twos and threes the great man's personality, and what changes the death would cause. Who would succeed to the helm? Would the body be brought to Quetta for burial, or would it be interred in the Jam's possessions? What would the Khan do? How would the Maris take the event? &c., &c. In an article in the *Calcutta Review* it was said :—"His death has removed the most conspicuous figure from the scene of border politics, for he was a Colossus with no compeer in his own line. A writer in the *Times* has described him 'as the peaceful conqueror of Baluchistan.' The territory he added to the State is as large as the German Empire, and when impartial Time 'gives to each the exact proportion due,' his name will be ranked with such illustrious names as John Lawrence and James Outram."

The Sandeman Hall was first used for any public ceremony at the Viceroy's Durbar on 12th April, 1900, during which the Hon. Mr. Barnes said :—"On 29th January, 1892, Sir Robert Sandeman died suddenly of pneumonia while on a tour in Las Bela. Shortly afterwards, the annual meetings or Jirgas of the Sirdars were held at the Sibi Fair, and in the course of these meetings the Baluch and Brahui Sirdars spontaneously resolved to erect a monument in memory of their late chief, and at a single meeting they subscribed over Rs.15,000 for the purpose. Their example was followed by the Khan of Kalat and others, and ultimately the private subscriptions rose to the sum of Rs.50,612, of which nearly Rs.9,000 were contributed by the merchants and townspeople of Quetta. It was resolved by the subscribers to utilise the money in building, in memory of Sir Robert, a Jirga Hall in Quetta, and in March, 1895, Sir James Browne commenced the present building. The design of the hall was obtained from Colonel Jacob, R.E., the well-known head of the Public Works Department in Jaipur, who with great kindness and liberality provided all the working plans free of expense. Nevertheless, the cost, as the building progressed, was found to largely exceed the estimate, and in the end we were compelled to appeal to the Government of India for help. The help asked for was generously given, and the building was at last completed in 1899, at a total cost, including the price of the site, of no less than Rs.116,305. The sum was made up as follows :—

Private subscriptions - - - - -	Rs.50,612
Subscriptions from Local Funds - - -	34,251
Allotted from Provincial Revenues - - -	13,781
Allotted from Imperial Revenues - - -	17,661
Total	116,305

At the same time that the Sirdars were raising money for the building of the Hall, the European friends of Sir Robert Sandeman also started a subscription list with the object of perpetuating his memory in Quetta. A sum of Rs.14,674 was subscribed, the greater part of which was spent in placing a handsome east window in St. Mary's Church at Quetta, and in obtaining the admirable portrait of Sir Robert Sandeman by the Hon. John Collier, which hangs in the Quetta Residency. Out of the surplus which was left, it was decided, after consulting the Sirdars, to obtain a *replica* of Mr. Collier's picture, and to present it to this Hall. That is the picture which is now hanging before your Excellency.

"The construction of a building of this kind is altogether outside the ordinary experience of the Military Works Department, and we owe a debt of gratitude to the officers who were in charge of the work, for the intelligence and ability with which it has been completed. These were Captain McCormick, R.E., to whose skilful supervision the successful result is mainly due; and Major Leslie, R.E., who superintended the completion of the ornamental designs. Great credit is also due to Mistri Hurnam Singh and to the contractors, Messrs. Haroun Devichand & Co., who have performed their work in a most thorough and praiseworthy fashion."

The design of the ground plan is a simple division into six squares. The Jirga Hall, which is in the form of a cross, consists of the central square, with its four wings, formed from the middle squares on each side. The

corner squares are formed into eight rooms, four on the ground floor and four above, to be used for library, record, store rooms, &c. The four upper rooms have galleries from which a good view of the main hall can be obtained. The large dome is over the centre square. The details have been artistically and intelligently worked out, with a perfect balance and symmetry which is "as inherent a quality of the works of nature as of true art." Fergusson says:—"Beauty lies in the thoughtful appropriateness of design, and intellectual elegance of detail, . . . and the forms that are best are the most appropriate to the purposes to which they are applied." The large hall, consisting of the central space with its four wings, expresses not only its constructive exigencies, but is most appropriate for the purposes of a Durbar or of a Jirgah (tribal council). Externally the building forms a most graceful and impressive whole, the skilful employment of the dome, which is artistically the most beautiful form of roof and especially appropriate in the East, has aided the graceful effect. In white marble the edifice would have been a perfect gem, but the original idea of constructing it with stone procurable in the district had to be abandoned on account of cost, so that it is built of brick. With brick, the danger in severe winters is the tendency of mortar to allow leakage, so that it will require careful watching to protect the fine plaster work in the interior from damage. The plaster ornamentation of the hall was designed by the School of Art, Lahore, and carried out by Mistri Hurnam Singh, and the plaster ornament in three of the small upper rooms was designed by two lady residents at Quetta. Those in the north-eastern and north-western rooms were designed by Mrs. Egerton, and the patterns are bold and well executed. To support a circular roof, a hexagonal base is first obtained by gradually filling up the corners of the room from the dado upwards, and this surface space is ornamented in plaster; above this the wall is broken up into a sixteen-sided figure, and on this comes the circular frieze which supports the dome. In the north-eastern room the frieze and two corner spaces have a vine pattern, and the two remaining corners a pomegranate pattern. The frieze and two corners in the north-western room are of Indian corn designs, and the remaining two corners of wheat. The ornament in the south-eastern room was designed by Mrs. Atree, the frieze and two corners being of rose pattern, and the two remaining corners of lily. The south-western room has conventional plaster designs not suitable to the rest of the building. The frieze has a dot-and-string pattern, and there are shields with renaissance designs in the corners.

It is a pity that the plinth (only two feet) was not higher, as the superstructure is not suitably shown off by such a low base. In summer the large hall is delightfully cool, but the winters in Baluchistan are severe, and the hall is then practically useless, as no method of heating has been adopted. Entering the hall with its mosaic stone floor, is almost as chilly as entering an ice-house. There are, however, fireplaces in the four lower rooms, the chimneys being at each corner of the building, and terminating most suitably in small domes, so as to be in harmony with the rest of the design. The building has a charming effect when viewed from a small distance, but the surroundings do not contribute, but rather detract from any heightening effect. Its picturesqueness could be greatly enhanced by having a direct approach from Lytton Road. This approach should have a row of trees on each side, and the Sandeman Hall could then be viewed from the Lytton Road as appearing at the end of the avenue. Surely such a masterpiece deserves suitable and artistic treatment; and as the land belongs to Government, it is like the traditional loss for the want of a hap'orth of tar. It is said that when the late Sir James Browne wished this approach made, the prejudices of a local official, whose compound would have slightly suffered, prevented this public improvement; but it is not too late for the subject to be re-opened.

The ground immediately surrounding the building is laid out as an ornamental garden, which is enclosed by a low wall with an iron railing. The two chief entrances to the grounds are east and west, and on each side of these entrances are erections, like the sentry boxes with graceful little domes which surmount the battlements of old native fortresses.

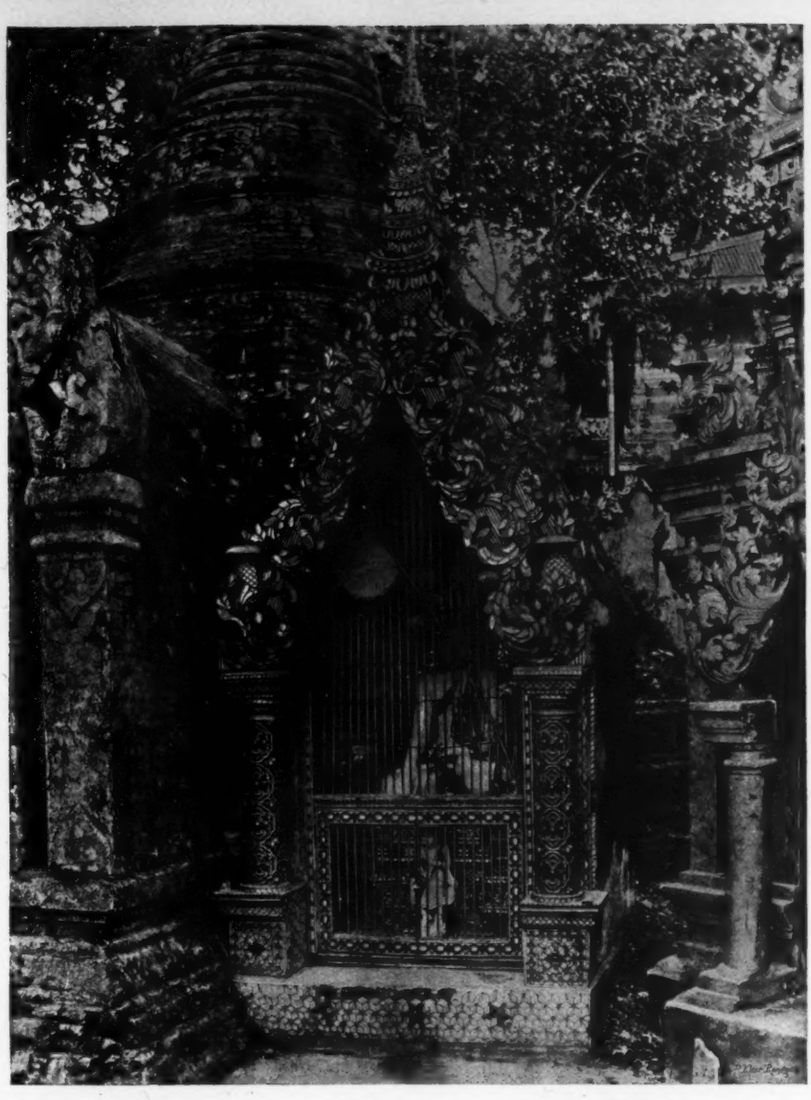
To paraphrase Fergusson, it might be said that the building is not sublime like the great hall at Karnac, it has nothing so intellectual as the Parthenon, nor constructively imposing as a mediæval cathedral, but it is simply a delightful Oriental gem.

I am indebted to the courtesy of Colonel Glenny, R.E., Superintending Engineer, for the ground plan; and Mr. Bremner, the celebrated Quetta photographer, has kindly given permission to reproduce the three photographs of the hall.

LIST OF ILLUSTRATIONS.

Glass Mosaics of Burma.—89. Group of Pagodas and Shrines in south-east corner of platform. 90. Shrines in south-east corner. 91. Base of main Shrine facing the east; Main Shrine facing the north. 92. Central portion of ceiling of northern Shrine; Detached Shrine in north-east corner. 93. Group of Pagodas at the base of old tree; Lower portion of a detached Shrine. 94. Details of Shrine shown in 93; Old Altars. 95. Old Box for holding manuscripts; Shrine on western face. *Modern Indo-Saracenic.*—96. Ground Plan and View of Sandeman Hall, Quetta. 97. From the west entrance. 98. Interior.

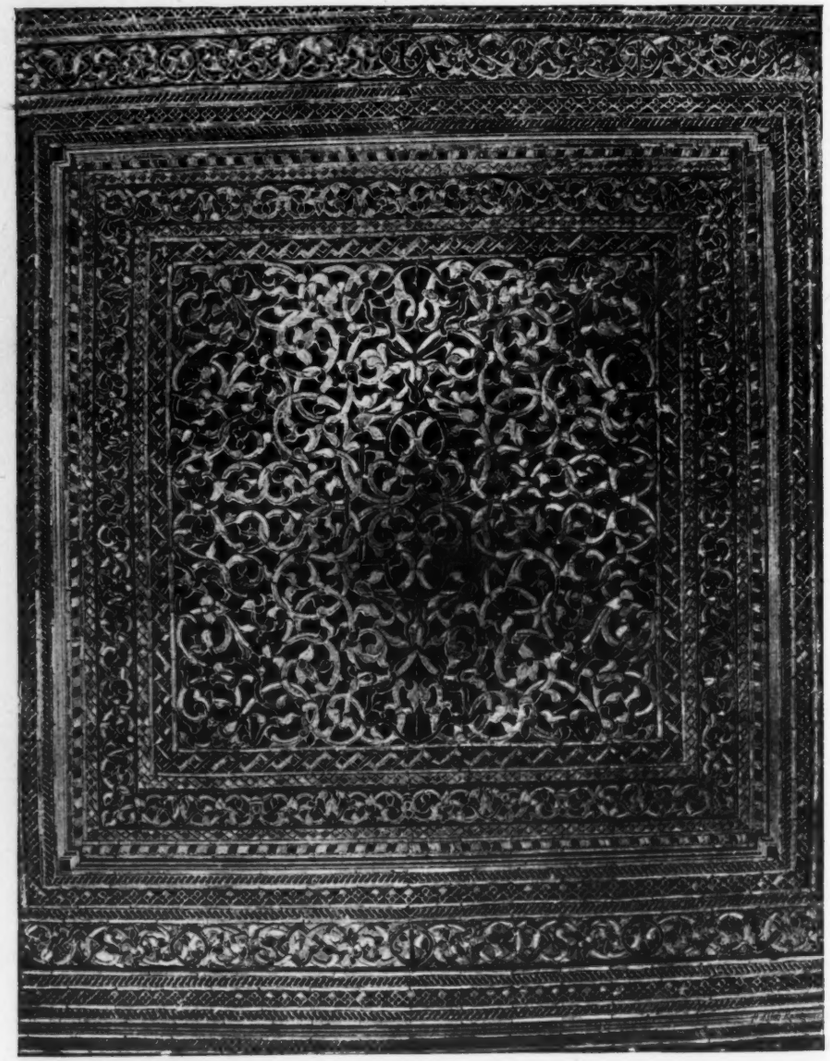
89.—Group of Pagodas and Shrines in south-east corner of Platform.



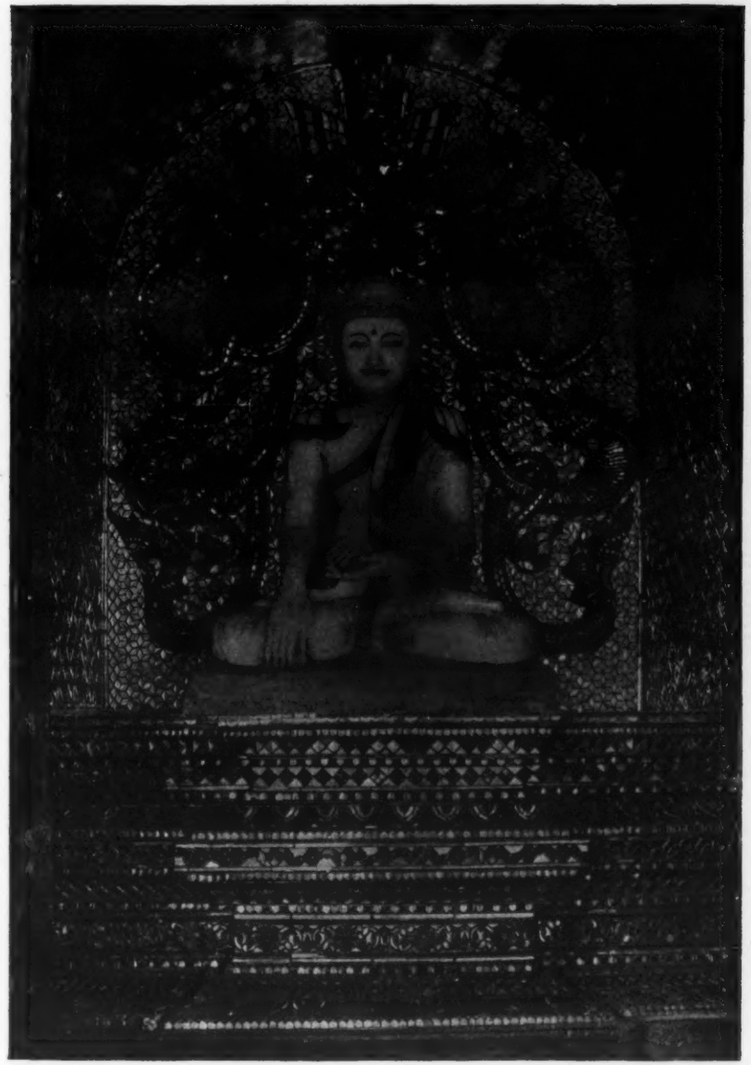
90.—SHRINES IN SOUTH EAST CORNER.

BASE OF MAIN SHRINE FACING THE EAST.

91.—MAIN SHRINE FACING THE NORTH.

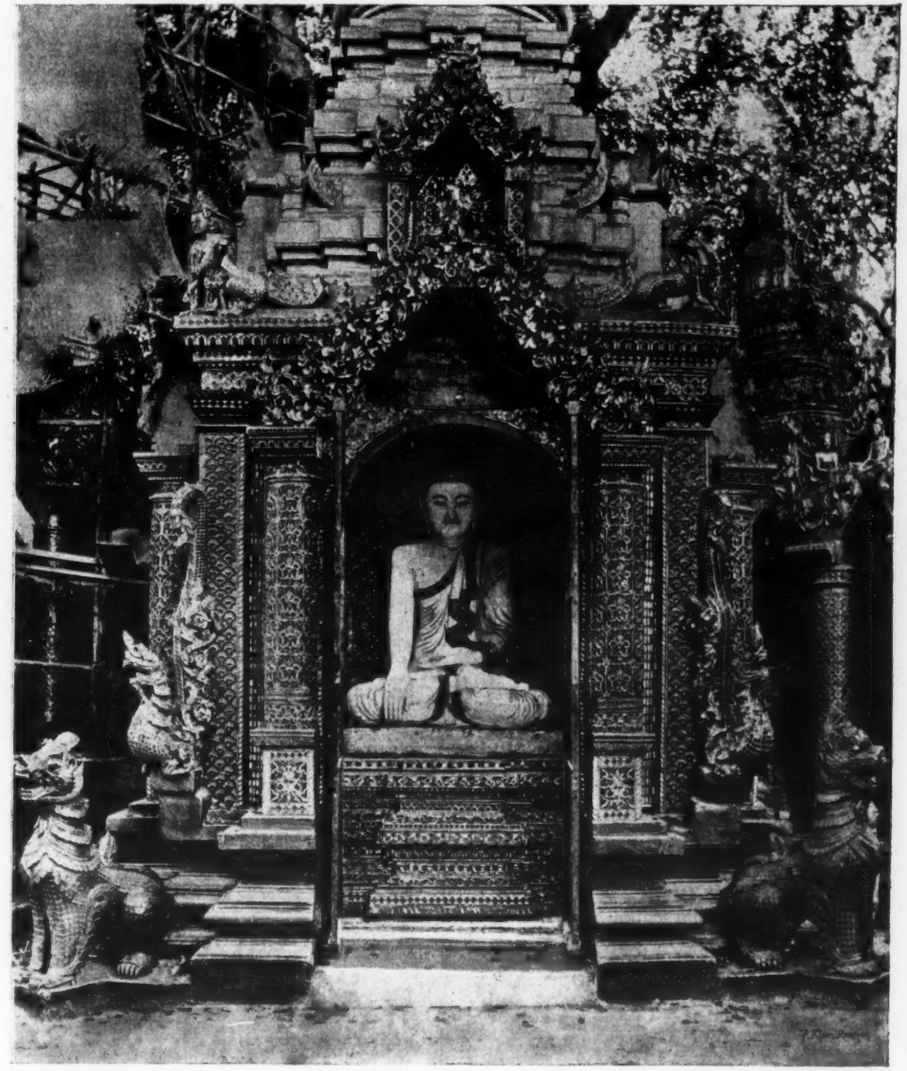


92.—Central Portion of Ceiling of Northern Shrine.



Detached Shrine in north-east corner.

93.—Group of Pagodas at the base of old tree.

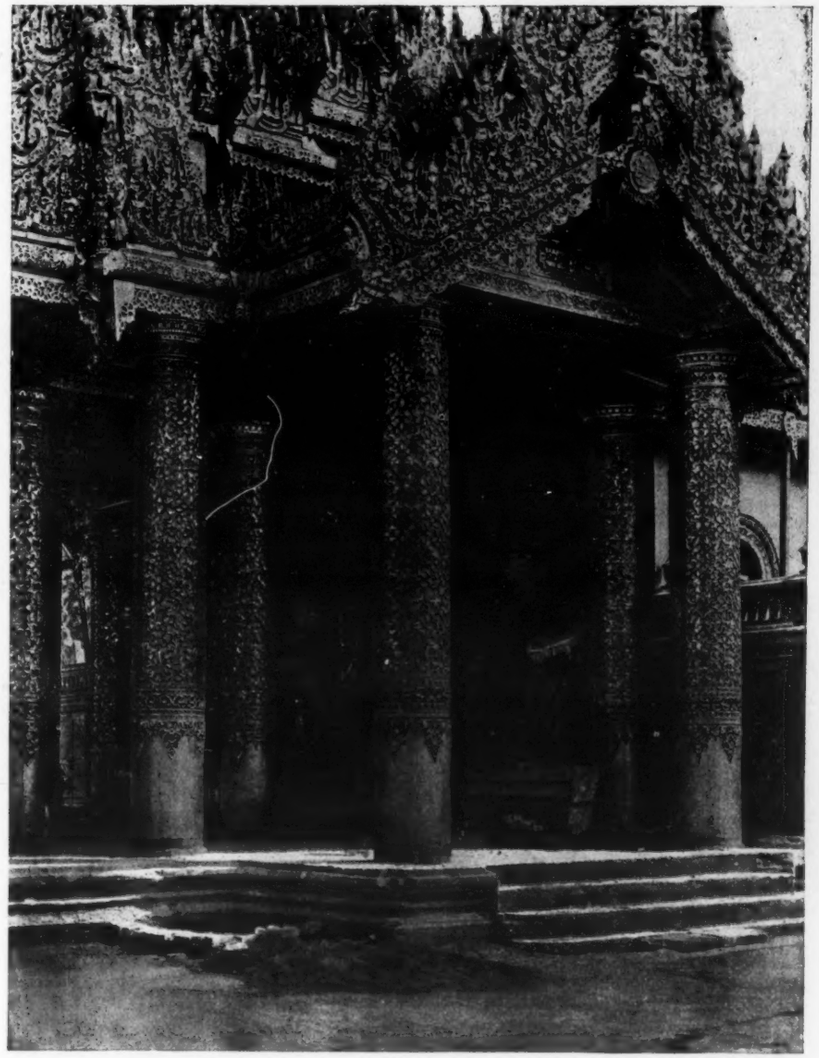


Lower portion of a detached Shrine.

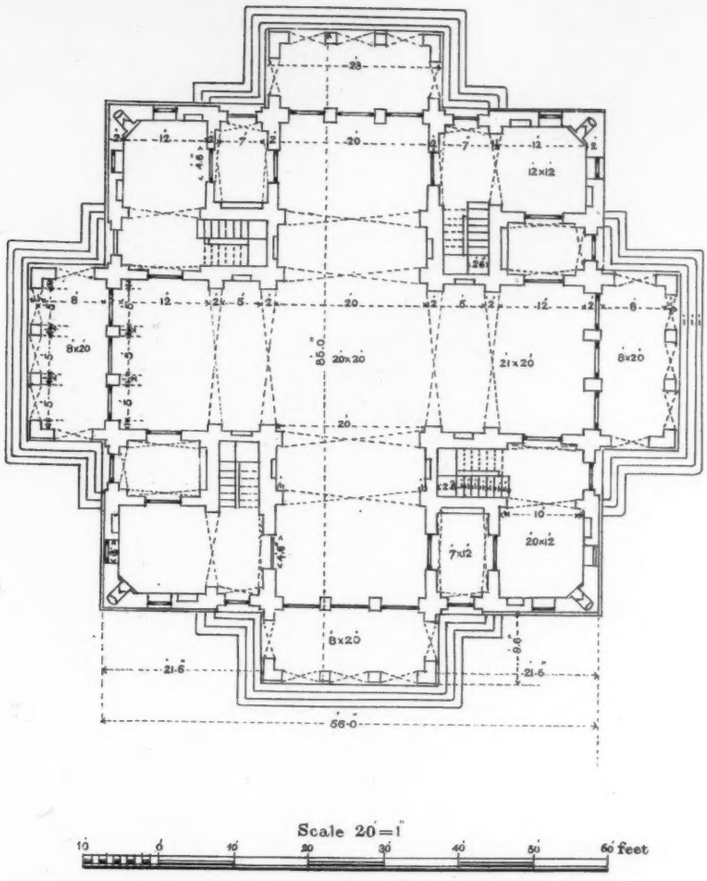
94.—Details of Shrine shown in 93.

Old Altars.

95.—Old Box for holding Manuscripts.

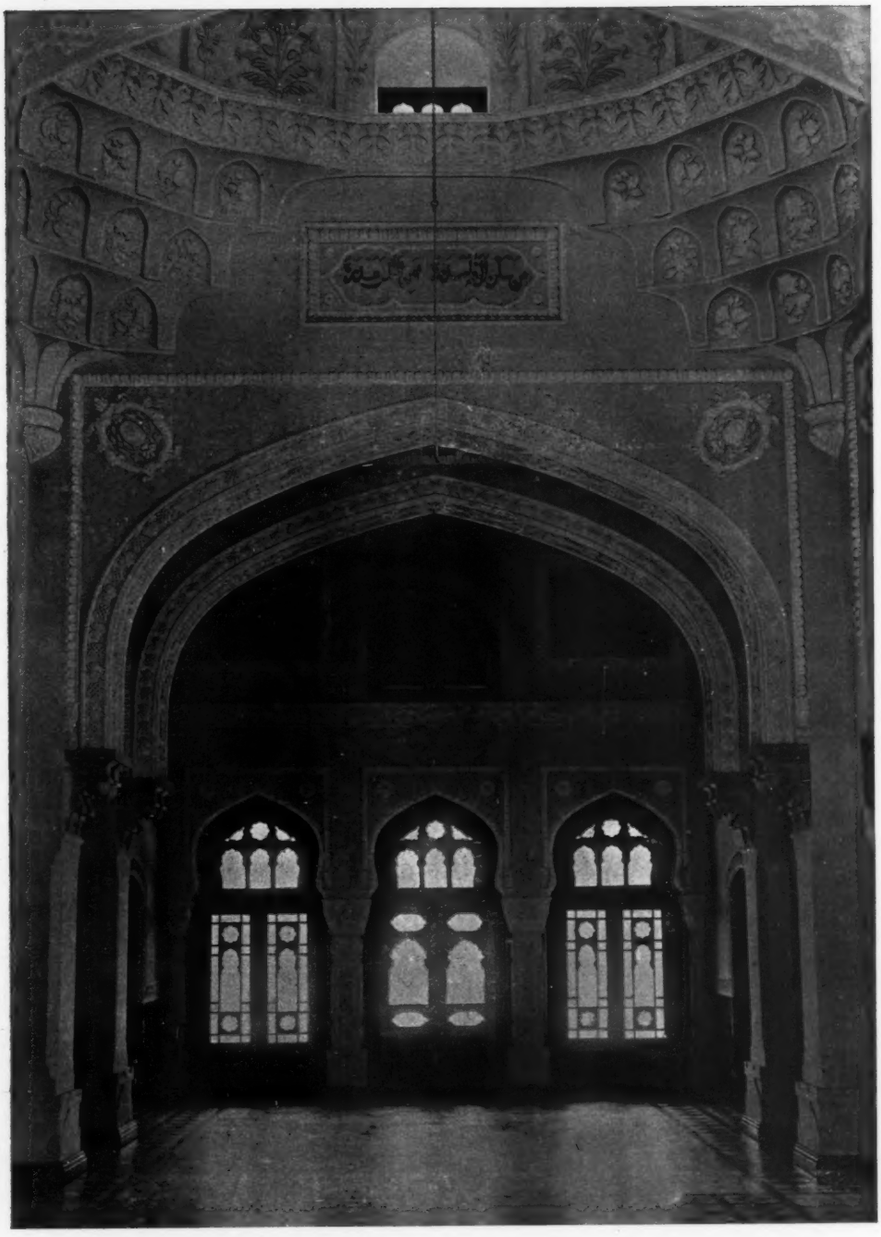


Shrine on Western face.



96.—Ground Plan and View of Sandeman Hall, Quetta.

97.—Sandeman Hall, from the West Entrance.



98.—Interior of Sandeman Hall.

The Journal of Indian Art and Industry.

SPECIMENS OF INDIAN METAL WORK (II.).

By J. H. RIVETT-CARNAC, Esq., C.I.E., F.S.A.,

Indian Civil Service (retired); Colonel Indian Volunteers; Aide-de-Camp to H.M. the King.

The April number of this Journal (No. 74) contained some account of the metal wares of various parts of India, illustrated by the beautiful photographs taken by Mr. Griggs of specimens exhibited of recent years at the Imperial Institute. In that paper a hope was expressed that it might be possible to include, in a later issue, photographs of a portion of the collection of the great Lord Clive, now in the possession of his descendant and successor, the present Earl of Powis. The necessary permission having been very generously accorded by the owner, it is now possible to conclude the paper, illustrating it with photographs of Indian work, which, besides the interest attaching to the specimens from their having been the property of one of India's most distinguished men, have the merit of being good examples of the work of those old days when the models were good, and when the craftsman devoted much care and time to every detail.

The remarks in the former paper related chiefly to the commoner metal work, much of it of considerable merit, to be found in most Indian bazaars, and which is well known in Europe by the collections brought home by tourists, and the contributions to recent Exhibitions in London and on the Continent. It has already been noticed that the standard of prosperity in an Indian household is marked by the vessels used in every-day life. As a poor family advances, earthenware pots and pans are replaced by vessels of brass or copper: the richer classes running to silver, or even gold, in their drinking cups and hookah-stands. A villager who has succeeded in reaching the metal stage, and who has set himself up in home necessaries, will, if good seasons or satisfactory trade have left him some margin, begin to think of investing his savings, and of laying up for a rainy day, and for the marriage and other ceremonies which will assuredly drain him later on. Our system of banks and cheque-books are unknown to village life. The old-stocking system of saving may have attractions for some, but it is accompanied with the disadvantages of possible theft, or loss. Long experience has established that the safest way to carry one's wealth, when it is but moderate, is on one's person. The village silversmith is busy when times are good; and days of scarcity or famine bring into the market not only occasional hoards of old coins, but silver and gold ornaments in immense variety, some of them of great merit and artistic value. The process of investment is in this wise. When the rupees of a successful sale are in hand, they are taken to the silversmith's shop; he, for a small fee, melts them down, fashions roughly a rounded bar, and bending it into a circle, fastens it on to the owner's arm, or on to that of the wife, or favourite child. Much art is not sought for by the poorer classes. It is enough to have the value there safe, and ready to hand. If times are bad, the bangle returns to the melting-pot; or, if the requirements are small, the bangle is unbent, a piece is snipped off from one end, and the remainder is hammered out into a lighter circlet, and is refixed on the seller's arm. The system may not compare favourably with the savings-bank book or the drawing of a cheque on one's banking account, but, if crude, is well understood, and sufficiently well adapted to Indian village life. It has, at least, little of the anxiety or uncertainty of other classes of investment, and experience has stamped it as highly practical. Those who have the time and inclination may see for themselves the process almost any day in an Indian bazaar. Some years ago, my wife and I were accompanied by Sir Mountstuart Grant-Duff, then a traveller in India, on one of our bazaar rambles, and our experiences were related by him in one of his publications. This is now related from my remembrance as an illustration of Indian life and business transactions. A villager had made a successful deal with some surplus cattle, and had been paid in rupees—a goodly cloth full. We followed him in his dealings. His idea evidently was that to carry home the bundle of coins would be inconvenient, and possibly risky. So he took them to a goldsmith in a neighbouring street, who, besides being a craftsman, was also a dealer in the metal. The contracting parties haggled for a time about the price and quality of the gold, and there was much gurgling and puffing of hubble-bubbles. When the preliminaries of the deal had been settled, and the rupees taken out from the cloth and carefully examined, counted, and weighed *en bloc* by the goldsmith, to ensure no excessive deficiency in weight, the pile was placed on neutral ground between the parties. The gold to be received in return was then carefully examined by the villager with the touchstone. The weights to be used were then tested by the help of a new

rupee, which weighs exactly one *tolah*. After this, the gold was weighed out by the goldsmith, and with the purchaser's assent, placed in the crucible on the charcoal fire alongside. During each process, the villager watched the gold as a cat would a mouse, to ensure that no alloy was introduced and no tricks played, managing the while to keep a part of his eye on the silver store in the centre. The soft, pure metal, when sufficiently heated, was roughly shaped into a narrow bar, like a rounded stick of sealing-wax, as noticed for the silver bangle. The gold was then again weighed, to prove that there had been no trickery in any of the processes, the purchaser keeping watch as intently as before. Satisfied that all was correct, he raised his arm, and the bar, which had been bent into a circlet, was securely fixed above the wrist, and the wealth was secure against anything short of a personal assault and violent robbery. The goldsmith then transferred the rupees to his side, and the transaction was completed with a further gurgling of the hubble-bubble. The bangle was entirely without ornament, and had been invested in for its intrinsic worth. Artistic treatment costs over and above the value of the metal, and such luxuries come later, when there is more in hand than can conveniently be carried in a bangle. One reads something of the same system of a currency in the romances in which the noble breaks a link or two off his golden chain and gives largesse.

If ornament is required, it can be had in time, but the workman must not be hurried. The implements used are very simple, and it is generally a matter of surprise to all travellers that delicate work can be elaborated with the clumsy-looking tools of the bazaar. But long years of practice, a delicacy of touch, and care and patience, produce quite marvellous results, as many beautiful specimens admired at recent Exhibitions will shew, and most of which have been made in the poor-looking quarters of Indian bazaars where one would hardly expect to meet with such treasures.

However, it is not proposed to include in the illustrations accompanying the present paper, selections from the many collections of Indian jewellery, or of objects used in personal ornament, which must remain for a future occasion. But it may be noticed that, under this heading, the variety is enormous, and that Mrs. Rivett-Carnac collected, in a comparatively short time, some seven thousand specimens shewing the most artistic forms, and those chiefly in use. The collection was exhibited at South Kensington and elsewhere, and is well known, and some examples may be selected to accompany a further paper on a future occasion. The only example of Indian jewellery now figured is a bracelet from the collection of the Earl of Powis, which will be noticed in its proper place. In India, as elsewhere, the designs for the jewelled and metal chaplets, necklaces, and other personal ornaments, were originally taken from plants or flowers, the blossoms, stems, leaves, and often seeds strung together for ornament being copied in more lasting material. Some of the most beautiful designs in the collection above referred to were in lac, a substance resembling sealing-wax, which admits of the forms of the flowers being readily modelled and accurately copied. Some portions are gilt, others painted in colours to represent gems, and an excellent result is secured at a low price. These ornaments are used by the poorer classes, and by women of the wandering Brinjara tribes. Of the metal ornaments the cheapest and commonest are of zinc, or lead. Most of these are cast, many of the forms being excellent, and following the patterns used by the rich in their silver and gold decorations. The anklets of zinc, worn by the poorer classes, are very large and of great weight, and it is a matter of surprise to Europeans that women working in the fields, and busy on household duties, can support such great encumbrances. But in India, as elsewhere, "*il faut souffrir pour être belle.*" The women of the richer classes wear these anklets in silver, though not in such colossal size. Sometimes two or three of these anklets are piled one on top of the other. Anklets are seldom worn in gold, to put gold on a woman's feet being to mark her out as a very special favourite. Among the richer classes ornaments of gold are loaded on to almost every other part of a woman's person, and the variety of chaplets and other ornaments for the hair, earrings, nose-rings, necklets, bracelets, armlets, girdles, anklets, and toerings is immense.

The objects included in the illustrations, and which have to be noticed in the present paper, are chiefly those which the higher classes use in table service, or in ceremonials such as *durbars*, and formal meetings, and represent the plate of a European establishment displayed on special occasions. All Indian potentates have sets of more or less magnificence of silver, or gold-plated, or gold; sometimes of gold inlaid with precious stones. The rich merchants, and those accustomed to entertain visitors with some ceremony, also have their more modest equipment of silver platters for *pan* leaf, boxes for the betel-nut, and a vase or bottle for attar of roses, or rose-water, offered to the guest before leave-taking. The high European officials who hold *durbars* are also provided with sets of these necessary ceremonial accompaniments, and some of this plate, handed down from the days when everything in India was done on a magnificent scale, is very handsome.

Several of the plates attached to the current number include photographs of *durbar* sets of the above description brought home from India by the first Lord Clive, and probably constantly used by him in the ceremonial receptions during the latter part of his marvellous career in India.

The interesting story of the boy of a great Shropshire family, who went out to India at an early age, rose there to the highest distinction, and did so much for his country in laying the foundation of our Empire in India, is well known, and need not be recapitulated here. Mr. Griggs has added a portrait of the great soldier-statesman as a fitting accompaniment to the plates of the specimens selected from the Powis collection, obligingly lent by the present Earl, who has succeeded to the honours and possessions of his celebrated ancestor.[1] The portrait is from a picture by Nathaniel Dance, and engraved by Bartolozzi.

The next plate of the present number, 100 in the series, includes, among other photographs, a jade vase, set in a network of gold, jewelled in rubies and other precious stones, following the graceful form of the vase, which is in the well-known shape of the *serai* or Indian water-bottle. The vase was probably used for *attar* or essence of roses, in ceremonial *durbars* or receptions in India. Jade of this size is extremely valuable, and is brought to India from the northern and eastern adjoining countries. The platter accompanying the vase in the photograph, is of silver-gilt, embossed, portions of the metal being left white, so as to give the effect of flat or rose diamonds being set in the gold. These platters, of which several are shown in later plates, are used in *durbar*, for serving betel-leaves, which are handed round to the guests at the close of the ceremonials, or as salvers for the rose-water bottles of a later plate in this collection. The platters are first turned on the wheel, the pattern being hammered out by hand, and the work is regular and excellent.

Plate 101 includes a gold and jewelled tiger's head, from the throne of Tipoo Sultan, a later acquisition of the Clive collection, and probably brought home by the second Lord Clive (created Earl of Powis), who was at one time Governor of the Madras Presidency. The other two specimens on this plate are both jade, jewelled hookah bowls of a somewhat similar type to the vase noticed in Plate 100, and formed part of the necessary paraphernalia of a great man's outfit at a time when Europeans in India lived much more in native fashion than now, and when the "*Sahibs*" smoked the hookah instead of the cigarette of to-day. The jewels on the bowls are set so as to resemble the flowers and leaves of plants, in a manner which is graceful and effective, and these and the other pieces of the same set, which follow, are all good specimens of a time when European influence had not come to disturb the native craftsman.

The two upper specimens on Plate 102 are of the same type as the foregoing, and appear to form part of the same set. The dome-shaped casket was probably used for areca nut, handed round with the *pan* leaves at *durbars*. The stand on the lower line to the left seems to belong to the set in which the platter of Plate 100 is included. The flowers form the support of a small vase for *attar* of roses, used in the manner already noticed. No. 4 in this plate, the only specimen of personal ornament figured, is one of the massive bangles or bracelets of a purely Oriental type, and of a form which is frequently to be seen reproduced on a somewhat smaller scale in Indian jewellery.

Plate 103.—The jewelled mouthpiece of the hookah-snake belongs to one of the sets already noticed. Next in order follow further portions of the silver-gilt *durbar* service of the platter of Plate 100. The vase and casket are both treated in the manner already noticed, the silver being embossed and gilt, whilst small, sunken, leaf-shaped depressions, at regular intervals, are left of their natural colour, so that at a distance they have the effect of table diamonds set in the metal. The box is much of the same shape as the filigree silver articles in a later plate, and was probably used for betel leaves and areca nut. This plate also includes a dome-shaped box and hookah, greatly resembling those of the preceding plate, but smaller and differing slightly in treatment.

In Plates 104, 105, 106, 107, follow the remaining articles of the silver-gilt set, the attar-of-rose phial placed among the flowers in the stand at the top of Plate 104 differing but little from that noticed in Plate 102; whilst the hookah-bowl is of the same shape as its jewelled predecessors, only made of less valuable material.

The rose-water vases or sprinklers, which follow on Plate 105, are of the long-stemmed type general throughout India, and are graceful and well-proportioned. At the close of a *durbar* the visitors are served with betel leaves and areca nut, and are sprinkled with rose-water from vases of this sort. This ordeal is pleasant enough, and not so severe as the anointing with attar-of-roses, which is of substance nearly as thick as treacle. Those present are served, according to rank, by the Maharaja or personage presiding at the *durbar*, or by his minister, or by attendants. An important visitor will receive a liberal supply of the strong-smelling essence, the small fry getting little, or none. A European receives his share on his handkerchief, but an Indian receives it on his clothes. That was at least, I believe, the old fashion; and I well remember, many years ago, a native officer of the old Nagpur contingent, a man of high rank, undergoing the ordeal. He was in command of the escort of the local Governor, who, on a tour through the Province, visited a native magnate. The commandant had provided himself with a new uniform of the light blue cloth then worn. Being of old family, he was singled out by the native

[1] Lord Clive's son and successor was created in 1794 Earl of Powis, and received among other titles that of Viscount Clive, the present Earl being fourth in direct descent from Baron Clive of Plassey.

Chief, who smeared the uniform liberally with the brown decoction, so that the honour, necessitating a new coat, was a costly one. The remaining platters of the set, used for the garlands of flowers, or necklaces of rich kincob placed round the guests at the close of a *durbar*, are of the types already described, and call for no special notice.

On Plate 109 is figured a part of a *durbar* set in delicate silver filigree, formerly the property of General Carnac, M.P., Commander-in-Chief in India, and now in possession of my sister, Mrs. Tilghman-Huskisson. The rose-water sprinklers and caskets are used in the manner already described. They differ from the foregoing specimens not so much in shape, as in the delicate silver filigree work, probably of Southern Indian manufacture, with which they are ornamented. General Carnac, who was a member of an ancient Breton noble family which emigrated to this country at the time of the revocation of the Edict of Nantes, entered the military service of the East India Company, was one of Clive's lieutenants at Plassey, and subsequently became Commander-in-Chief in India. He returned to England at one time as a Nabob, entered Parliament, and married the daughter of my great-grandfather, Mr. Rivett, M.P. and High Sheriff for Derbyshire. The set has a curious history, and can claim some remote connection with the Powis collection already noticed. The second Earl of Powis found the set, marked with General Carnac's[1] name, among a large number of Indian articles which he had inherited, and good-naturedly saying that the specimens ought to belong to the family, gave them to my father, the late Admiral Rivett-Carnac. Whether they were given by General Carnac to the great master under whom he served, or sold, or got mixed up with Lord Clive's possessions when these officers were marching together, there was nothing to show.

Mr. Griggs has included among the plates a photograph of Mrs. Carnac, the wife of the General, from the celebrated picture by Sir Joshua Reynolds. The picture, which is now in the Wallace collection (having been unfortunately sold by the late Sir J. Rivett-Carnac, Bart., M.P.), is well known, and has been engraved by Smith and others. In connection with this picture it may be noticed that, during the recent craze for mezzo-tints, a print sold at Christies' reached the record price of 1160 guineas, or about ten times as much as was paid to Sir Joshua for the original picture.

The remaining plates represent Indian work of a much later date. The large rose-water bottle on No. 110 follows the old shapes, whilst its companion, though embossed with deities from the Indian pantheon, approaches the familiar design of the conventional bottle. The silver bowl, occupying the third place, is of Burmese work in high relief, somewhat similar to those figured in the plates of a former issue.

The *serai* and the Persian water vessel of Plate 111 are Indian in shape, though the former appears to have suffered somewhat from improvements, and lacks the more graceful outlines of the *serais* of the ordinary type. The casket is of very delicate and tasteful filigree work, representing leaves and blossoms.

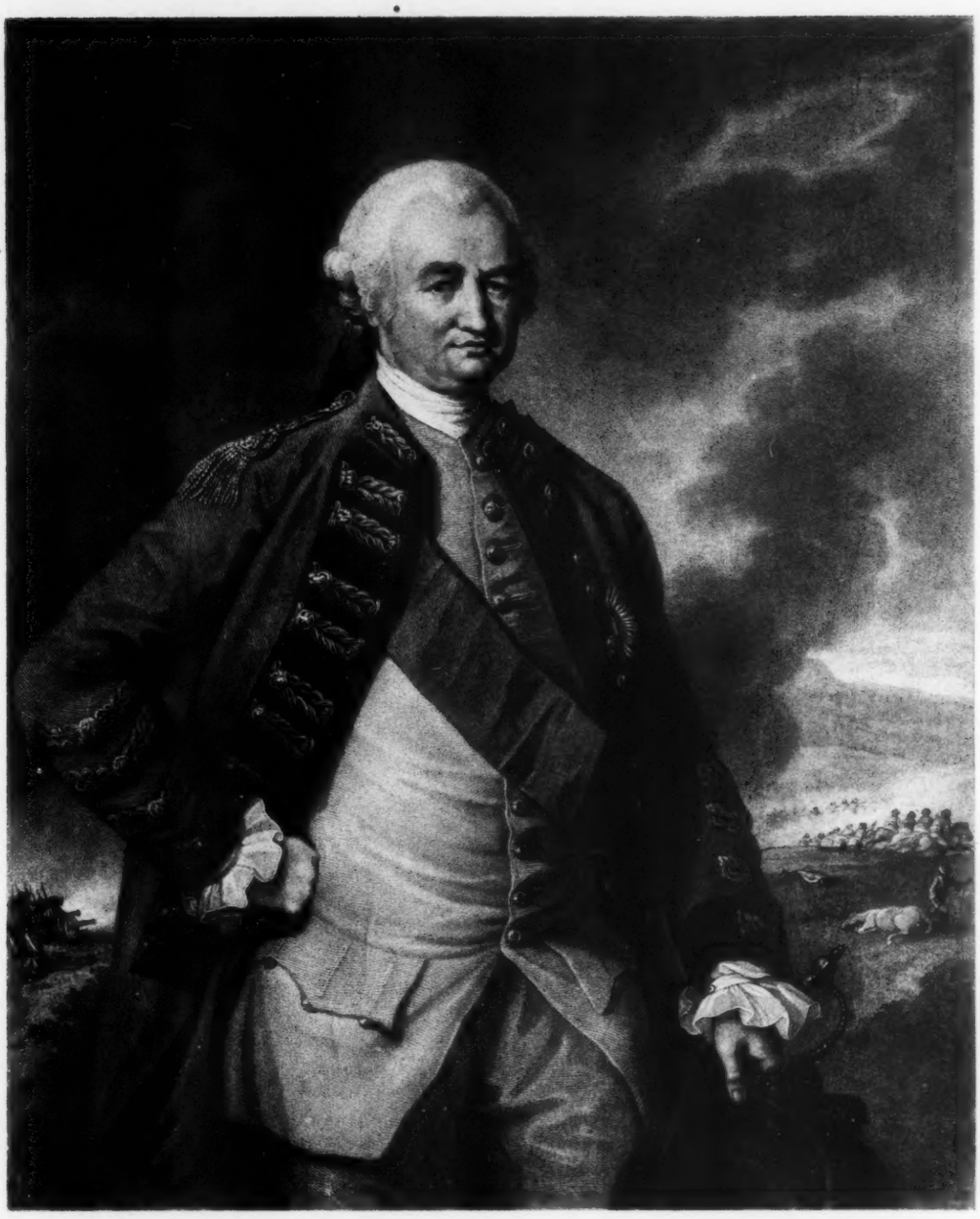
There may be more than one opinion regarding the merits of the tea-pot and sugar-basin of Plate 112. They speak for themselves, and as there is a demand for them in this shape, some, at least, are likely to be satisfied. By itself, the upper specimen is hardly open to objection, and the workmanship is good.

Of the remaining specimens, the last two are distinctly Eastern, and will commend themselves to many. They are similar to those that come from Bokhara; and the last is specially quaint and practical with its bird-like spout, capable of liberal libations.

[1] General Carnac, though no blood-relation of the family, left his property to his brother-in-law, my grandfather, Mr. Rivett, on the condition that he assumed the name of Carnac in addition to his patronymic.

LIST OF ILLUSTRATIONS.

99. Portrait of Lord Clive. 100. Jewelled jade vase and silver-gilt dish. 101. Jewelled tiger head and hookah bowls. 102. Jewelled bracelet, hookah stand, &c. 103. Jewelled and silver-gilt ornaments. 104. Silver-gilt ornaments. 105. Silver-gilt rose-water vases. 106, 107. Silver-gilt platters. 108. Portrait of Mrs. Carnac. 109. Silver filigree work. 110. Indian silver filigree rose-water bottle; Burmese silver bowl and bottle. 111. Persian water jugs and silver filigree casket. 112. Silver tea set. 113. Silver chased water vase. 114. Silver filigree platter. 115. Northern Indian or Persian water vase. 116. Water vase from Bokhara.



99.—Lord Clive.

From a painting by Nathaniel Dance, engraved by Bartolozzi.

100.—Jewelled Jade Vase and Silver-gilt Dish.

Formerly belonging to Lord Clive; from the collection of the Earl of Powis.

101.—Jewelled Tiger Head and Jewelled Hookah Bowls.

Formerly belonging to Lord Clive ; from the collection of the Earl of Powis.

102.—Jewelled Bracelet, Hookah Stand, &c.

From the collection of the Earl of Powis.

103.—Jewelled and Silver-gilt Ornaments.
From the collection of the Earl of Powis.

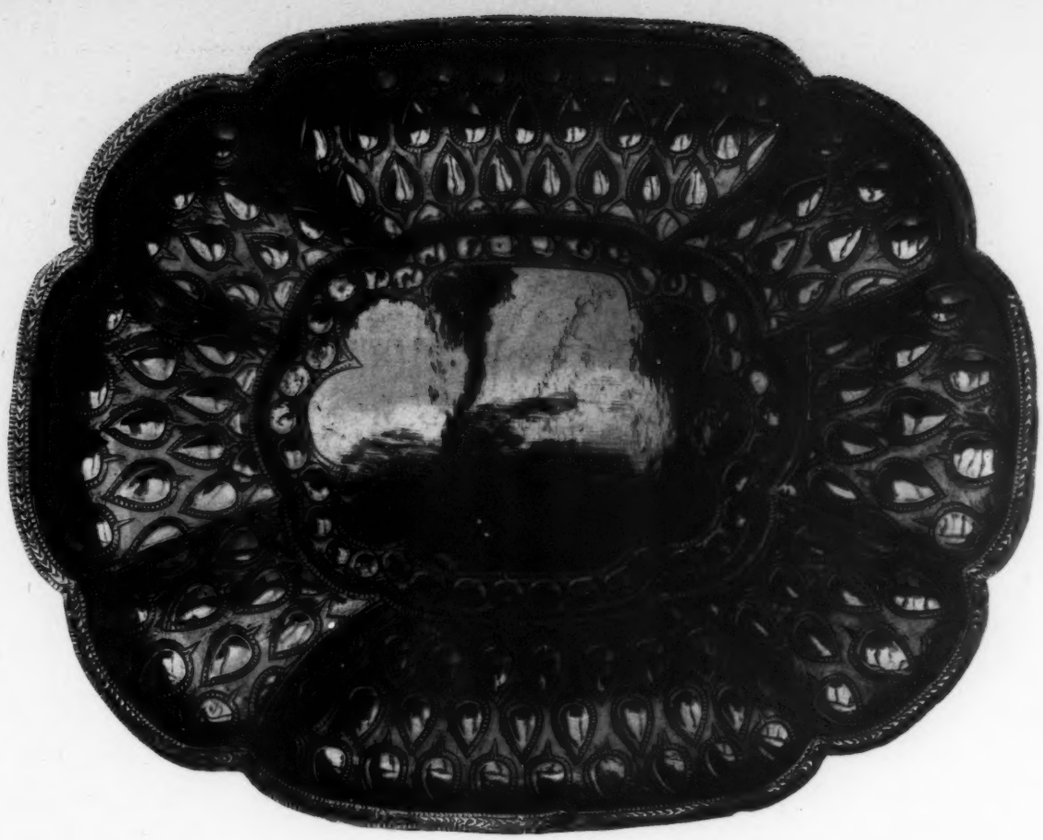
104.—Silver-gilt Ornaments.

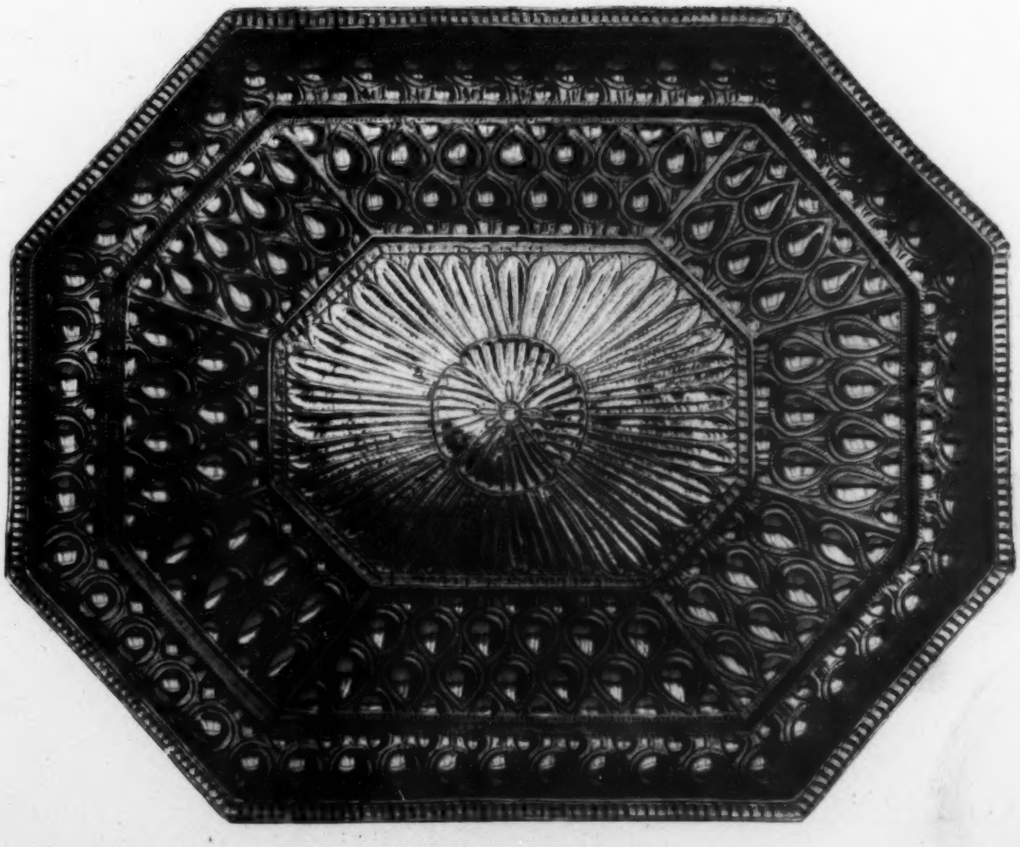
Formerly belonging to Lord Clive ; probably portion of a *Durbar* set.

From the collection of the Earl of Powis.

105.—Silver-gilt Rose-water Vases.
Used in *Durbar*, forming part of the preceding set.
From the collection of the Earl of Powis.

106.—Silver-gilt Platter.
From the collection of the Earl of Powis.





107.—Silver-gilt Platters.

Part of the preceding *Durbar* set.

From the collection of the Earl of Powis.

108.—Mrs. Carnac,

Daughter of T. Rivett, Esq., M.P. and High Sheriff for Derbyshire; married General Carnac, M.P., Commander-in-chief in India.

From the picture by Sir Joshua Reynolds, P.R.A.

109.—Silver Filigree Work.

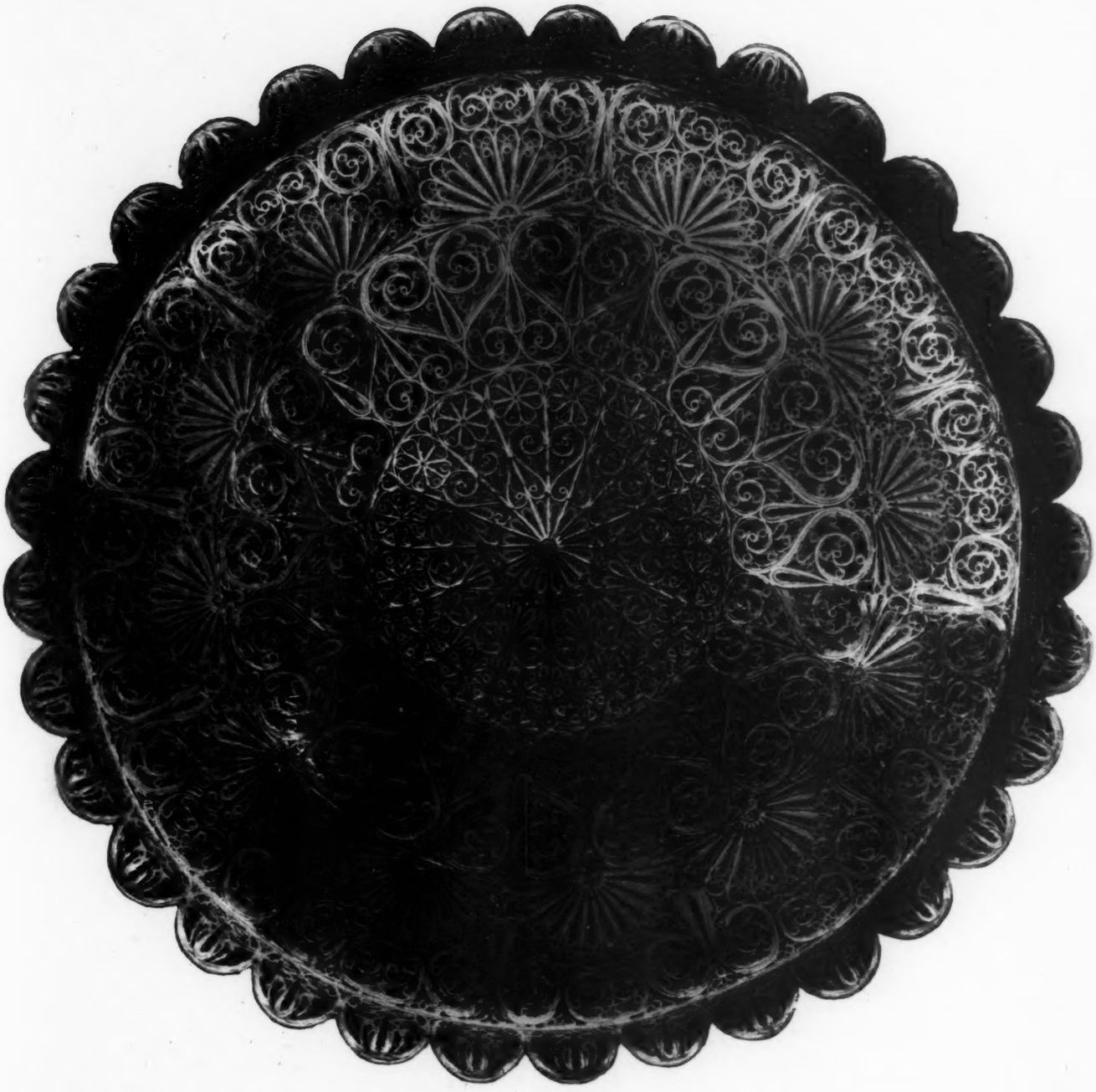
Formerly the property of General Carnac, M.P.

110.—Indian Silver Filigree Rose-water Bottle,
Burmese Silver Bowl and Bottle.

III.—Persian Water Jugs and Silver Filigree Casket.

112.—Silver Tea Set of Southern Indian manufacture.

113.—Silver Chased Water Vase.



114.—Silver Filigree Platter.

115.—Northern Indian or Persian Water Vase.

116.—Water Vase from Bokhara.

The Journal of Indian Art and Industry.

MOGHUL COLOUR DECORATION OF AGRA.

ILLUSTRATED BY EXAMPLES FROM THE CHÎNÎ-KÂ-RAUZÂ, ITIMÂD-UD-DAULAH'S TOMB, AND THE KÂNCH MAHAL.

By the late EDMUND W. SMITH, Esq., M.R.A.S.,
Archæologist to Government of India, N.W. Provinces.

The Moghul style of architecture which sprang up about the year A.D. 1556, under King Akbar, terminated about the middle or later part of the 17th century. The style may be broadly divided into two schools; classed under the first, are the buildings erected by Akbar and his son Jahângîr between the years A.D. 1556 and 1630, and under the second, those built by Shâh Jahân between the years A.D. 1640 and 1658. As is well known, the Moghul empire was at its zenith under Aurangzîb, the last of the great Moghuls, but the style of architecture associated with the name of the Moghuls declined rapidly and steadily under his sway. None of Aurangzîb's buildings can compare with the stately structures erected by Akbar, Jahângir and Shâh Jahân.

Between Akbar's buildings and those of his son Jahângir there is, as a rule, but slight difference; but between their buildings and those of Shâh Jahân there is a most marked difference. Akbar's and Jahângir's works are strongly infused with Hindû architecture. Timber is almost unused and the arch sparingly so; but under Shâh Jahân the Hindû element becomes less prominent and gradually fades away. The Hindû bracket and flat architrave used over doorways and windows makes way for the Muhammadan arch, and the beautiful decoration in red sandstone, as found at Fatḥpur Sîkrî and the Jahangîrî Mahal in the Fort at Agra, give place to mosaic in *pietra-dura*, as exemplified in Itimâd-ud-daulah's tomb and the Tâj Mahal.

The stately buildings erected during Akbar's reign are not entirely devoid of colour ornamentation; and some of the Fatḥpûr Sikrî buildings, erected towards the end of Akbar's rule, were richly decorated with frescoes. Marble mosaic was also used, notably in the Jâmî Masjid, one of the finest mosques in India. Even prior to Akbar's time we find the Pathân builders relying on white marble to enliven the severeness of their façades, but it was not till the reign of Shâh Jahân that coloured inlaid ornamentation became a leading characteristic of the style. Jahângir relied more on the mosaic decoration for beautifying his buildings than did Akbar, and an example of this is seen in the gateway leading to the grounds surrounding his father's tomb at Sikandrâ.

A little later than the completion of Akbar's mausoleum, commenced by himself but finished by Jahângîr between A.D. 1605 and A.D. 1615, we find a new element being introduced along with the marble mosaic, in the shape of inlaid designs in coloured stones, known as *pietra-dura*. In Itimâd-ud-daulah's tomb we see both systems employed; but in the Tâj, Agra, and the Delhi palaces, erected between A.D. 1628 and 1668, the *pietra-dura* work is almost exclusively used and is the characteristic feature of the style.

Besides marble mosaic and *pietra-dura* ornamentation, the Moghuls relied to some extent, as did the Pathâns before them, on enamelled tiling for the enrichment of their buildings. It had been employed from an early period by the Persians upon their structures, and came into use in India about Sher Shâh's time.

Akbar used encaustic tiling upon the stately palaces at Fatḥpur Sîkrî for roofing purposes and for enriching architraves and borders round doorways, &c., and Jahângîr also used it for covering the domed kiosks round the third storey of his father's mausoleum and in the Kânch Mahal at Sikandrâ.

In these and other buildings it was sparingly used, but in the mosque erected at Lahor by Jahângîr's Vizir, and the Chînî-kâ-Rauzâ, Agra (Plate 117*a*), we find the exterior walls, as in many Persian buildings, covered throughout with encaustic tiling. This kind of decoration is called "Kashânî," after Kashân in Persia, one of the chief seats of earthenware manufacture.

In addition to the styles briefly mentioned above, fresco paintings were extensively employed by the Moghuls for decorative purposes, and in many of their buildings, commencing with Akbar's time and downwards, we find frescoes used frequently upon the walls of their palaces and tombs.

Few Moghul buildings appear to have been entirely covered with enamelled tiling, and about the only one in Northern India, now extant, is the Chînî-kâ-Rauzâ, Agra, on the left bank of the Jumna, between Itimâd-ud-daulah's tomb and Râm Bâgh, the garden where, according to tradition, Bâbar's body rested till conveyed to Kâbul for burial. The difficulties connected with the manufacture of enamelled tiles may have had something to do with their being so sparingly used.

Red sandstone was easily procurable and could be obtained in any quantity from quarries outside Fathpur Sîkrî, whilst white marble could be imported from Jaipur. The manufacture of glazed tiles was no doubt introduced into India from Persia; it was not indigenous to the country, and the art has almost died out, although to some extent it is carried on in the Panjâb.

The Chînî-kâ-Rauzâ, from which most of our illustrations are taken, stands in what was a large garden, but is now a field. The grounds were enclosed on the north, south and east sides by walls, and on the west the river formed a natural boundary. Roughly speaking, the grounds measured 323 feet from north to south and 462 feet from east to west. On the north-west corner is a picturesque tower, crowned by a cupola, coated on the outside with enamelled tiles.

The tomb faces the river, but is set back some distance from the banks, to which it was probably connected by ghât or quay. It is a rectangular-shaped building, measuring 79 feet 4 inches each way (see Plate 117*a*). Within is an octagonal chamber, 27 feet 10 inches in diameter and 37 feet in height, covered by a dome. Surrounding it are other chambers and vestibules with rooms over. Beneath the building is a crypt, which at one time was ornamented, like the exterior of the fabric, with coloured tiling.

With the exception of the tiling, there is nothing very striking about the design of the façades. The central portion, over the archways in the vestibules, breaks up above the main line of the parapet, and affords a little relief to what otherwise would be a rigid sky-line. The large archways in the vestibule are built of brick, and the sides are covered on the exterior with tiles ornamented with quotations from the Qorân in Tughrah characters (see Plate 117).

On the sides of the archways are slender shafts which extend from the plinth of the building to the roof. They are covered with crimson, orange and white tiles laid in a zig-zag pattern. At the angles of the building are similar shafts veneered with blue and white tiles (see Plate 118). The shafts run up the sides of the building to just below the cornice where they stop, but reappear again above the parapet crowned by flower-shaped capitals (see Plate 119).

The spandrils above the vestibule archways were covered with blue and white tiling worked into beautiful scrolls upon an orange ground (Plate 120).

The Chînî-kâ-Rauzâ is built of bricks, and as many as six courses go to a foot. Many of the bricks are only 7 in. long, 4½ in. wide and ¾ in. in thickness, but the mortar joints are thick. Exteriorly the tomb is coated with mosaic in tiling worked up into numerous patterns, whilst the interior is floated over in stucco painted with rich floral designs. The glazed patterns are made up of thousands of small pieces of tiles carefully embedded into the face of the plaster covering the brickwork. Fig. 5 (Plate 118) is a section through the front surface of the wall, and shows the brickwork to be covered with a coat of plaster two inches thick, overlaid with a finer coat an inch in thickness, into which the tiles ⅝ of an inch in thickness are bedded.

Plate 121 shows a piece of the walling from which the tiling has fallen, and the original position the tiles occupied may be seen. A section through the face of the wall is given on the left-hand side of the plate.

Plate 122 is a diagram, to a larger scale than most of the illustrations, of one of the panels on the south side of the east façade. It shows what a number of tiles were used in making up a single panel. The joints between the various tiles are shown in white. Plate 123 depicts the parapet and frieze around the top of the façades. Between the frieze and the parapet is a concave-shaped moulding projecting 10 inches in advance of the face of the parapet, which is shown in section on the right-hand side of the plate.

Plate 124 illustrates a panel over a small window in the south end of the east façade lighting a room on the first floor. It is one of the largest panels in the building. The window is only 1 ft. 6 in. wide by 2 ft. 5 in. in height. The framing round it is of red sandstone surrounded by a white tiled border studded with blue and crimson tiles. The ground of the panel is of an ochre colour, and inlaid upon it are three flowering trees. They extend from the head of the window to the top of the panel, which (as the illustration shows) is engrailed, and on each side of the window opening is also a tree. The trunks of the trees and the branches are represented in deep crimson, the leaves in green, and the flowers in a variety of bright hues.

Plate 125 represents the tiling upon an archway over a door on the ground floor leading into a room on the south-east angle of the building. The field of the *tympanum* of the arch is of a deep royal blue colour, and embedded upon it is a flowering creeper in orange and white. The ground of the spandrils over the arch is laid with orange tiles, let in upon which is a delicate scroll made up of conventional flowers and bunches of pomegranates. Enclosing the outer sides of the archway is a floral border in orange-coloured tiles upon a blue ground edged with white and green borders. The tiling upon the lower portion of the archway has long since fallen and left exposed the old plaster *key*, into which it was bedded, and behind it the brick wall.

The next illustration, Plate 126, shows two panels immediately below the window lighting a room on the first floor of the building at the east corner, and Plate 127 represents other panels on the sides of these. The panels shown on Plates 128, 129 and 130 are all taken from the east façade, but the remainder of the plates, dealing with the exterior decoration of the tomb, are from the north front, with a few exceptions.

Plate 131 is a panel above a doorway in the east side of the north elevation. In the centre of the panel corresponding to what ordinarily would have been a window, is a rectangular-shaped lattice 1 ft. 7 in. wide and 2 ft. 4 in. in height. It is composed entirely of straight bars in blue tiles placed at right angles to each other, so as to form a number of square and oblong spaces, which are alternately filled in with white and red tiles. Surrounding the lattice is a field of green tiles, inlaid with conventionally treated flowers in various bright colours. The field is edged with very narrow blue tiles worked into the shape of an arch over the top of the lattice. Enclosing the field of the panel is a rectangular frame, and the angle-pieces between it and the top of the arch above the lattice are laid with dark gamboge tiles, let in upon which are floral scrolls in various colours, harmonizing with those surrounding the lattice work in the centre of the panel.

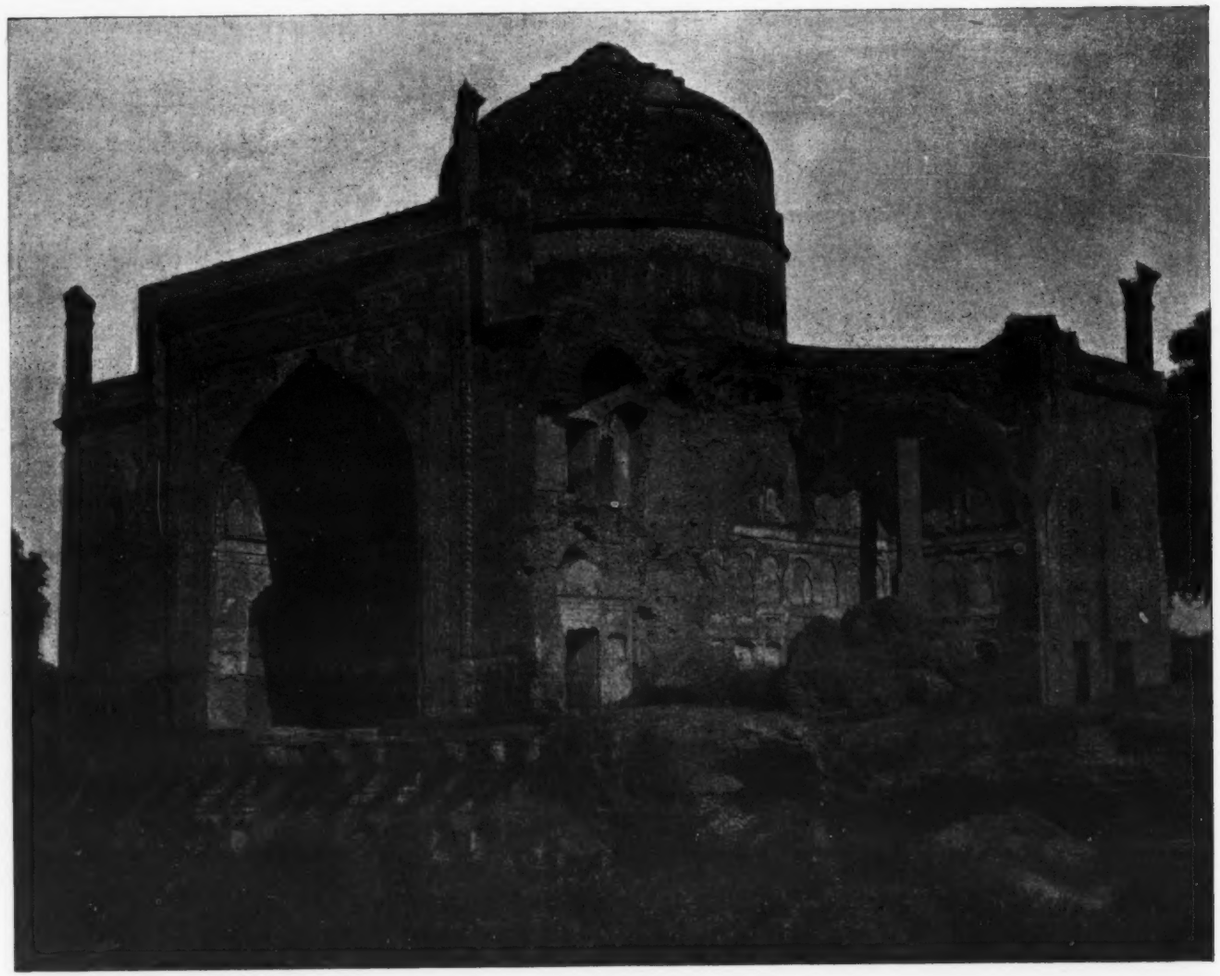
Plate 132 shows two panels also from the north façade, one above and the other below that just described. The designs of the flowers are more realistic than some of the others. The flowers upon the upper of the two panels shown on the plate may be intended for lilies, whilst those upon the lower panel may be meant for passion-flowers.

The patterns on the panels depicted on Plates 133 and 134 are also more realistic than many of those portrayed on the other panels. They are not so stiff, and the leaves and flowers are arranged in graceful curves so as to leave no gaping spaces so detrimental to good design. In some instances white grounds have been employed in lieu of coloured ones.

(*To be continued*).

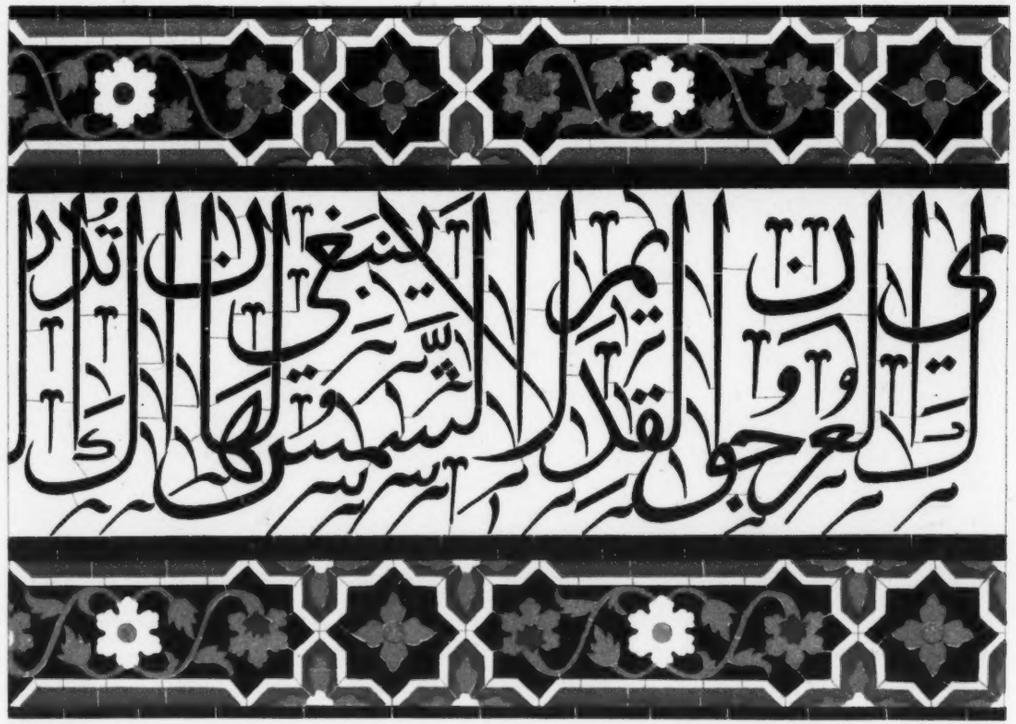
LIST OF ILLUSTRATIONS.

117*a*. View of the Chînî-kâ-Rauzâ, Agra. 117. Tiled text in Arabic characters. 118. Detail of coloured tiling. 119. Detail of finials. 120. Tiled spandrils. 121, 122. Tiled panels. 123. Detail of tiled parapet and cornice. 124 to 134. Tiled panels.



117*a*.—The Chînî-kâ-Rauzâ, Agra. General View from the banks of the Jumna.

AGRA : Chini-ka-Rauza. Tiled Text in Arabic Characters round the Great Archways.



Section

SOHUN LAL.

Inches 12 6 0 1 2 3 Feet

SCALE OF FEET

Edwd. W. Smith

Archæological Surveyor N.W.P.

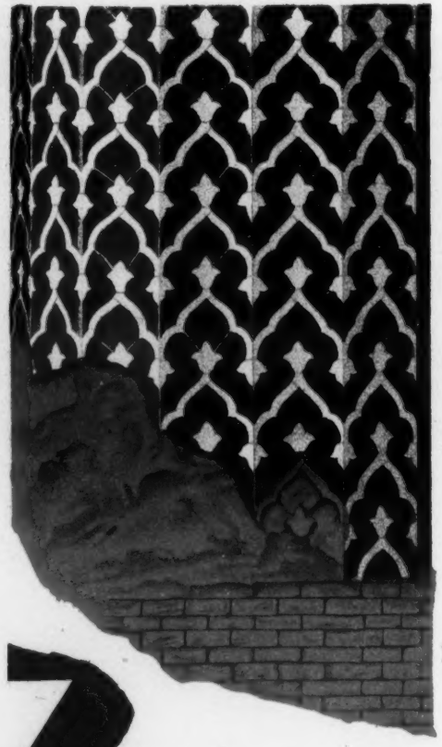


Fig. 1. Elevation of shafts upon the angles of the building—marked A on the Elevation, Plate XI.

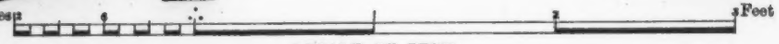
Fig. 5. Section through wall showing *keys* of plaster into which the tiling is bedded.

Fig. 3. Elevation of shafts on the sides of the great archways marked B on Plate XI.

Fig. 4. Plan.

Fig. 2. Plan.

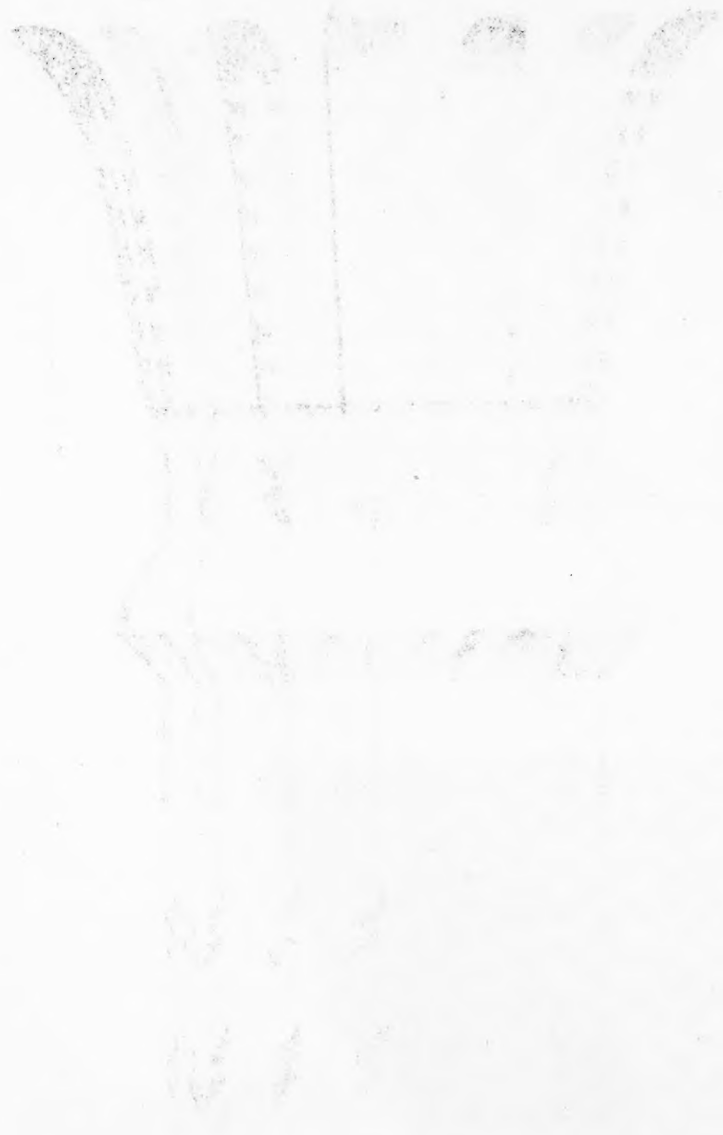
SOHUN LAL, DEL.



SCALE OF FEET

Edwd. C. Lueth

Archæological Surveyor N.W.P.



AGRA: Chíní-ka-Rauza. Details of Finials surmounting Polygonal Shafts upon the Angles of the Tomb.

Inches 12 6 0 1 2 3 Feet

SCALE OF FEET

Edmd. W. Smith

Archæological Surveyor N.W.P.

RAM PRATAP & SOHAN LAL.

AGRA : CHÎNÎ-KA-RAUZA. EAST FAÇADE—TILED SPANDRILS OVER THE ARCHED ENTRANCE.

Corresponding to that marked M on the Elevation, Plate XI.

Inches 0 1 2 3 Feet

SCALE OF FEET

Edmd. W. Smith

Archæological Surveyor N.W.P.

AGRA: CHÎNÎ-KA-RAUZA. TILED PANELS ON THE EAST FAÇADE, SOUTH SIDE.

Panel marked L on the Elevation, Plate XI.

Section through wall showing *keys* of plaster into which the tiling is bedded.

Inches 12 9 6 3 0 1 2 3 Feet

SCALE OF FEET

RAM PRATAP DEL.

Archæological Surveyor N.W.P.

AGRA : CHÎNÎ-KA-RAUZA. TILED PANELS ON THE EAST FAÇADE, SOUTH SIDE.

Panel marked H on the Elevation.

RAM PRATAP I. DEL.

Inches 12 9 6 3 1 Foot

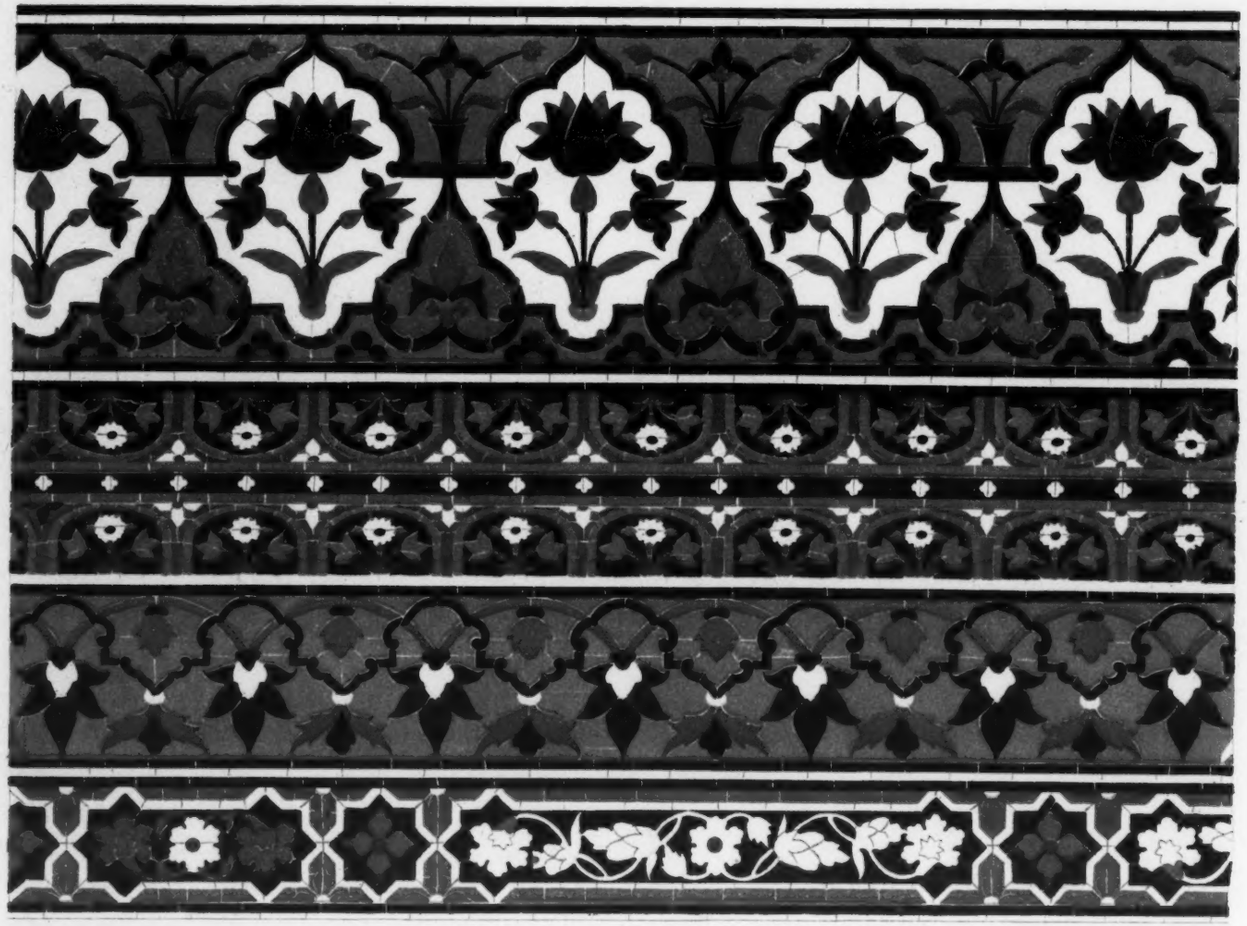
SCALE

Edmd. W. Smith

Archæological Surveyor N.W.P.

AGRA : Chînî-ka-Rauza. Detail of Tiled Parapet and Cornice round top of the Building.

Marked C on the East Façade, Plate XI.



Section

RAM PRATAP I

Inches 12 6 0 1 2 3 4 Feet

SCALE OF FEET

Edwd. W. Smith

Archæological Surveyor N.W.P.

AGRA: CHINI-KA-RAUZA. TILED PANEL ON THE EAST FAÇADE, NORTH SIDE.

Large archway over the first floor window. Corresponding to that marked D on the Elevation.

SOHUN LAL, DEL.

Inches 0 6 1 2 3 4 Feet

SCALE OF FEET

Edwd. W. Smith

Archæological Surveyor N.W.P.

AGRA: CHÎNÎ-KA-RAUZA. TILED PANELS ON THE EAST FAÇADE, SOUTH SIDE.

Arch over doorway. Marked K on the Elevation, Plate XI.

SOHUN LAL, DEL.

Inches 12 9 6 3 1 2 3 Feet

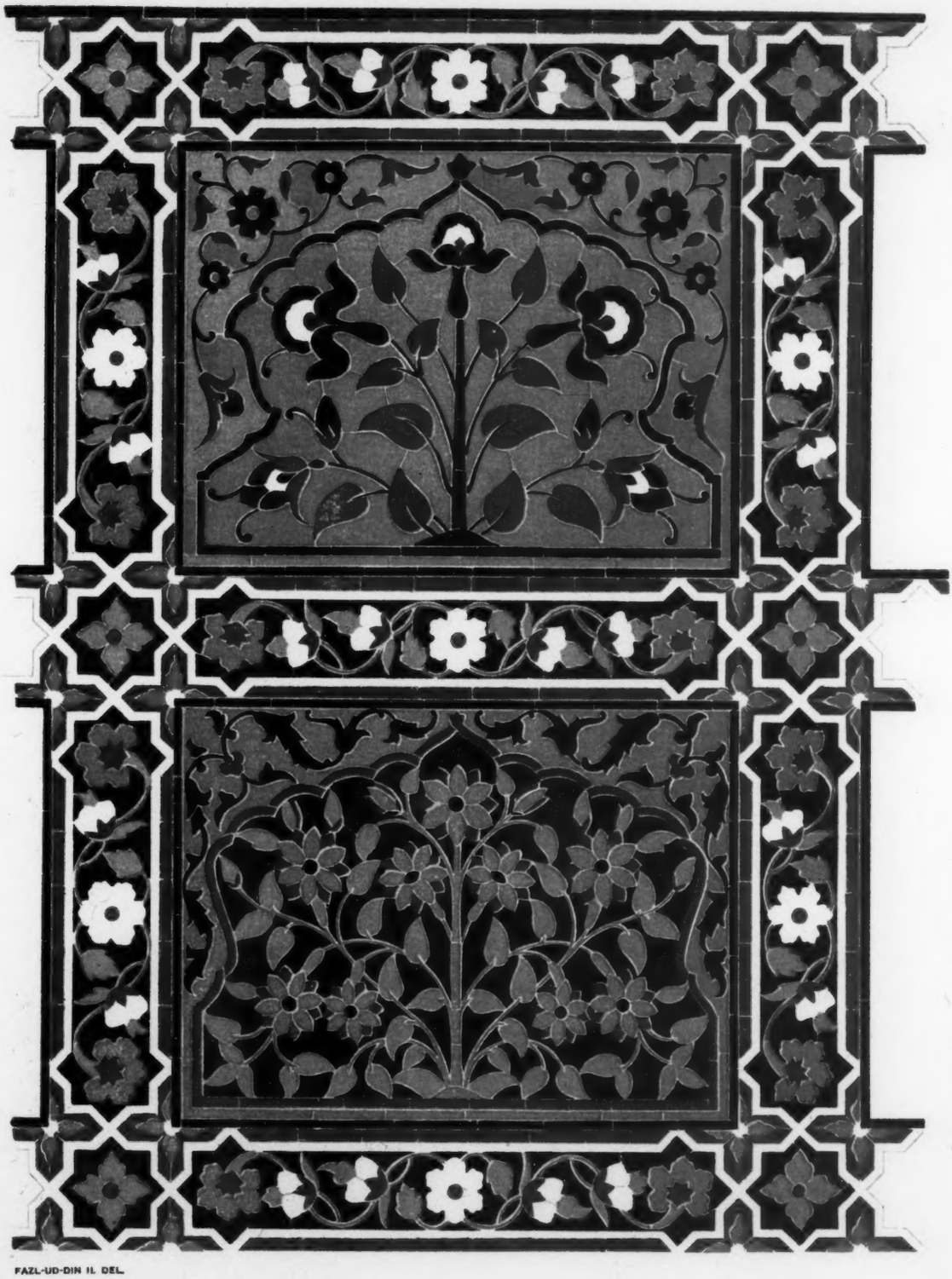
SCALE OF FEET

Edmund W. Smith

Archæological Surveyor N.W.P.

AGRA: Chînî-ka-Rauza. Tiled Panels on the East Façade, South Side.

Marked J, J, on the Elevation,



FAZL-UD-DIN IL DEL.

Inches 12 9 6 3 1 2 3 Feet

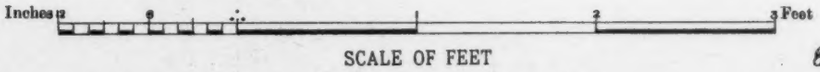
SCALE OF FEET

Archæological Surveyor N.W.P.

AGRA: CHÎNÎ-KA-RAUZA. TILED PANELS ON THE EAST FAÇADE, SOUTH SIDE.

Marked I, I, on the Elevation.

RAM PRATAP II. & SOHUN LAL, DEL.



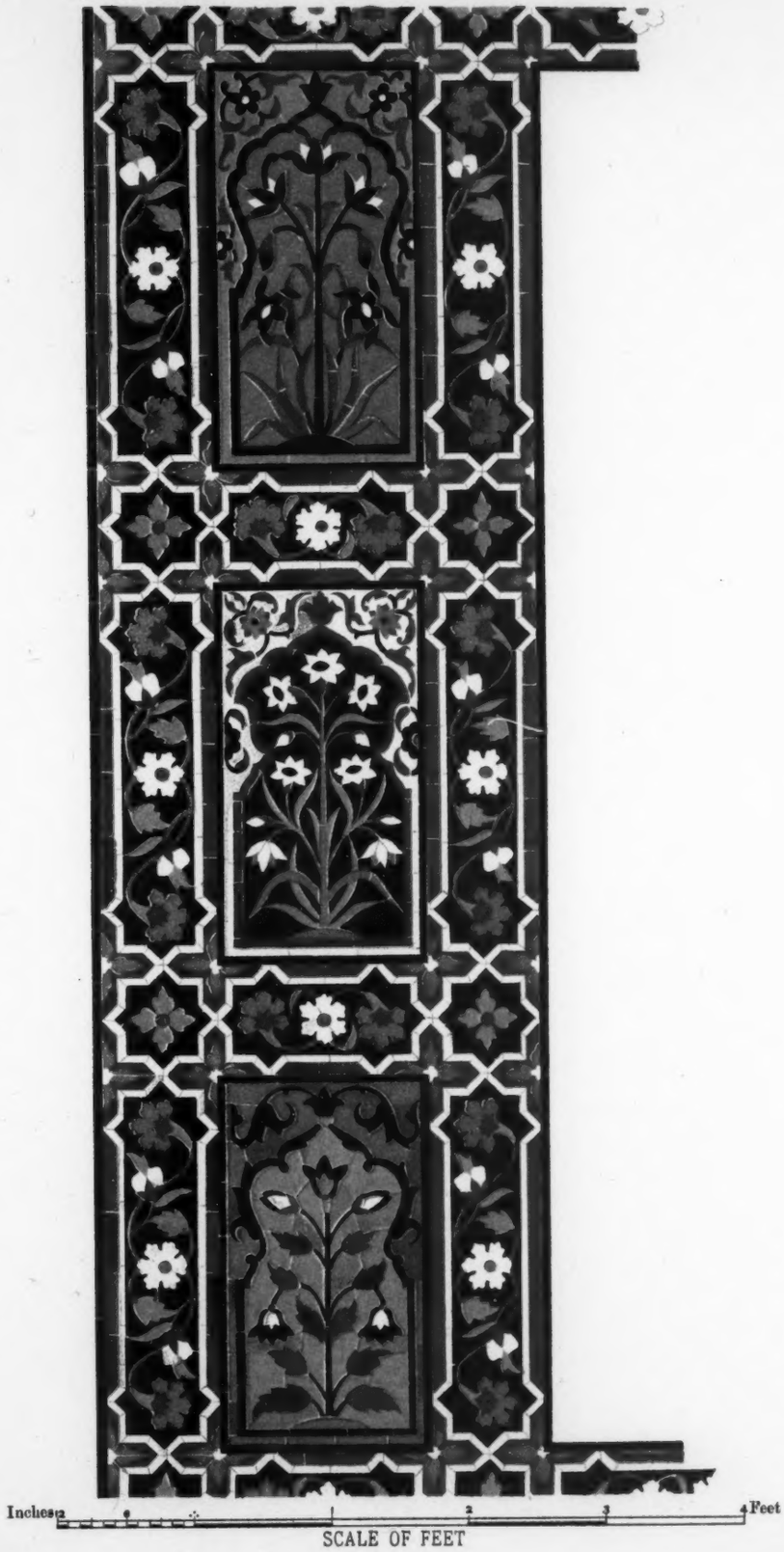
SCALE OF FEET

Edward B. Smith

Archæological Surveyor N.W.P.

AGRA: CHÎNÎ-KA-RAUZA. TILED PANELS ON THE EAST FAÇADE, SOUTH SIDE.

Marked E, E, on the Elevation,



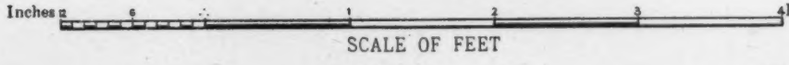
SCALE OF FEET

RAM PRATAP II. DEL.

Archæological Surveyor N.W.P.

AGRA: CHÎNÎ-KA-RAUZA. TILED PANELS ON THE EAST FAÇADE, SOUTH SIDE.

Panels marked F, F, on the Elevation.



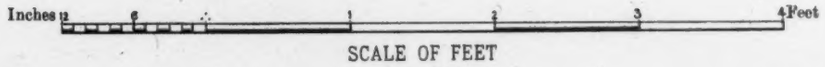
SCALE OF FEET

Edwd. W. Smith

Archæological Surveyor N.W.P.

AGRA: CHÎNÎ-KA-RAUZA. TILED PANELS ON THE EAST FAÇADE, SOUTH SIDE.

Marked G, G, on the Elevation.



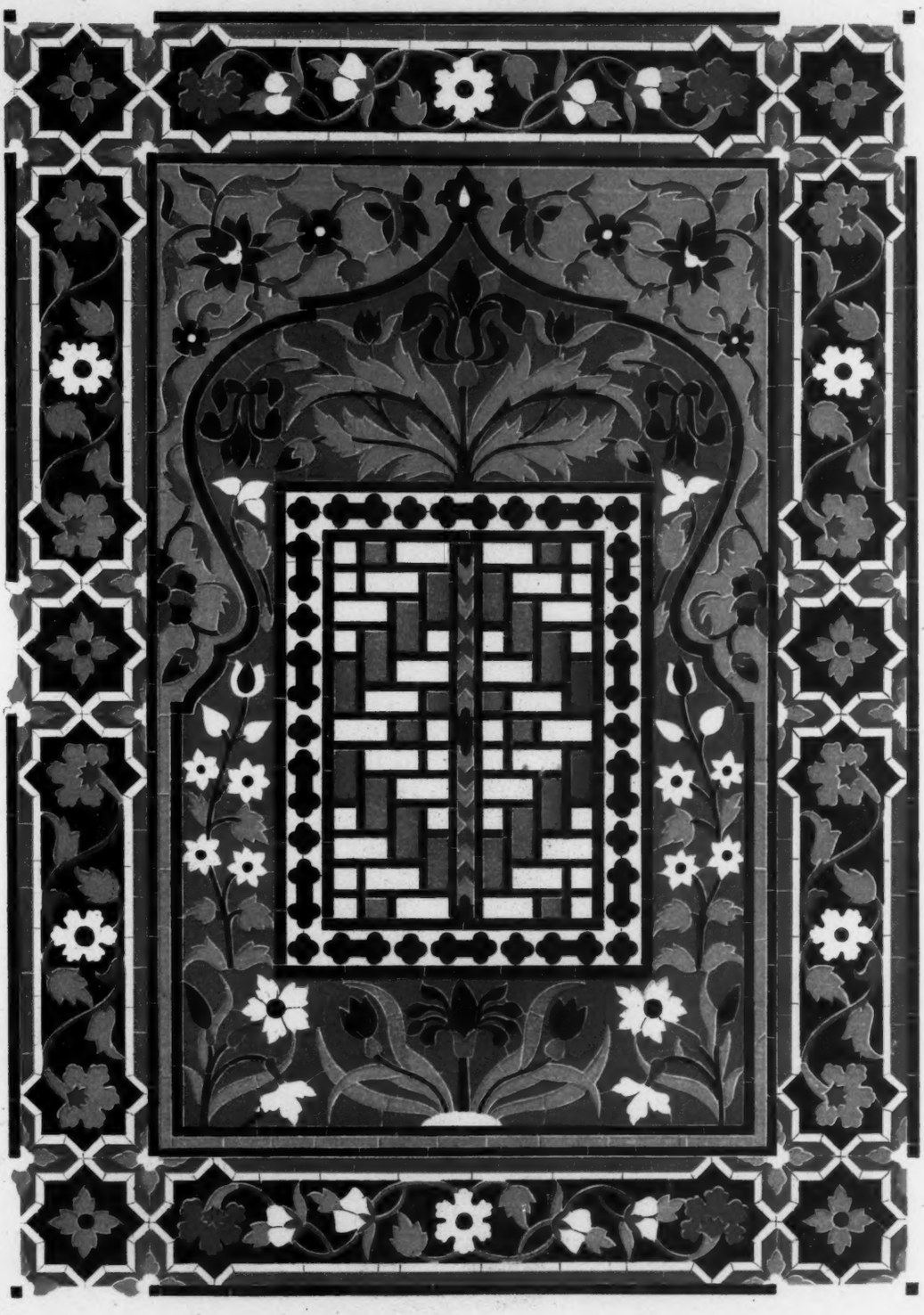
SCALE OF FEET

Edmund W. Smith

Archæological Surveyor N.W.P.

AGRA: Chiní-ka-Rauza. Tiled Panels on the North Facade, East Side.

Panel marked I on the Elevation, Plate XXIV.



SOHUN LAL, DEL.

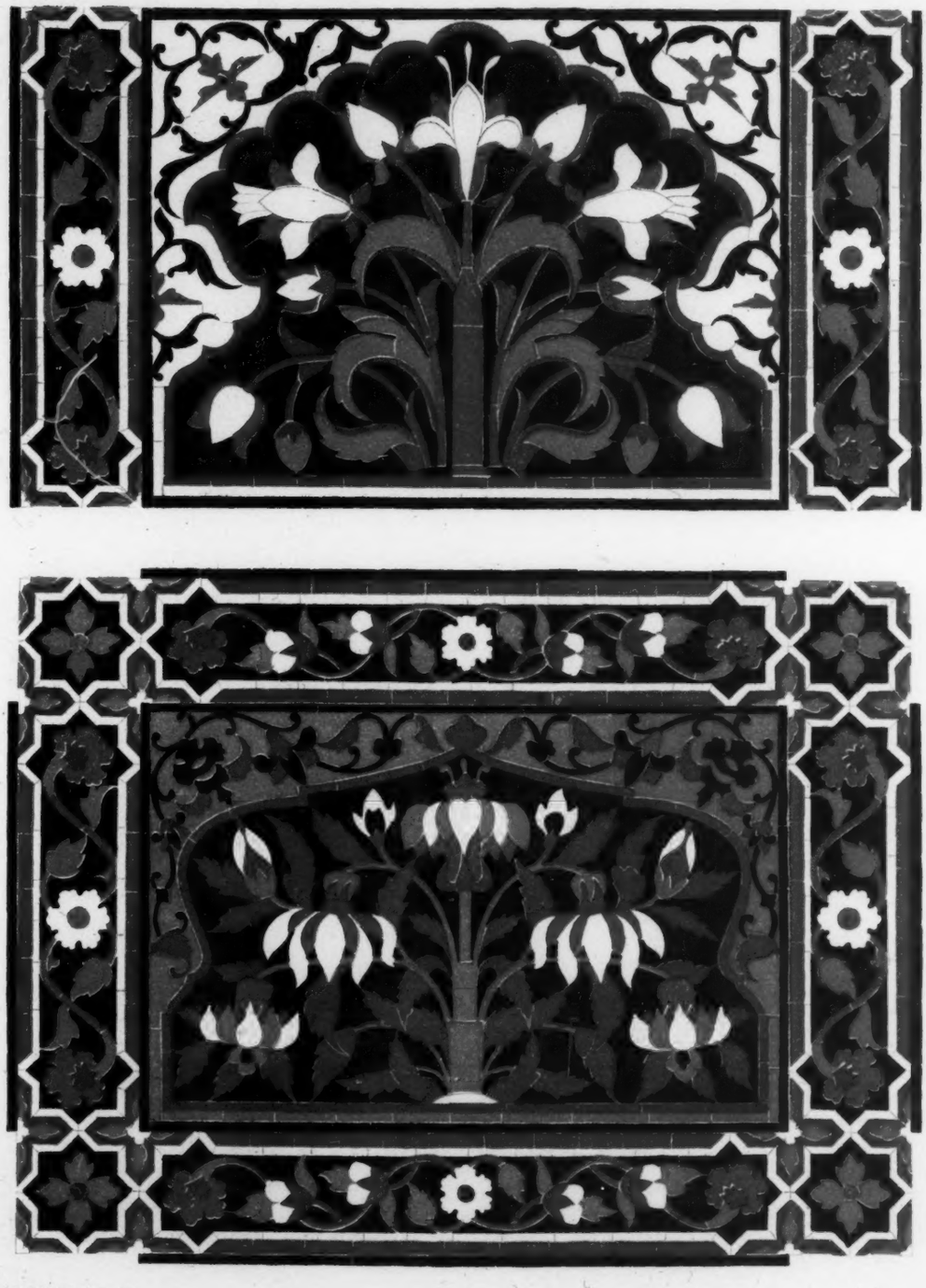
Inches 12 6 0 1 2 3 Feet

SCALE OF FEET

Edwd. W. Smith

Archæological Surveyor N.W.P.

AGRA: Chînî-ka-Rauza. Tiled Panels on the North Façade, East Side.
Marked E. E. on the Elevation, Plate XXIV.



FAZUL-UD-DIN I., DEL.

Inches 0 1 2 3 Feet

SCALE OF FEET

Edmd. W. Smith

Archæological Surveyor N.W.P.

AGRA: CHÍNÍ-KA-RAUZA. TILED PANELS ON THE NORTH FAÇADE, EAST SIDE.
Marked B, B, on the Elevation.

SOHUN LAL, DEL.

Inches 12 9 6 3 0 1 2 3 Feet

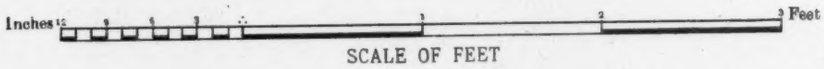
SCALE OF FEET

Edmd. W. Smith

Archæological Surveyor N.W.P.

AGRA : CHÎNÎ-KA-RAUZA. TILED PANELS ON THE NORTH FAÇADE, EAST SIDE.

Panels marked A, A, on the Elevation,



SCALE OF FEET

Edward W. Smith

Archæological Surveyor N.W.P.

The Journal of Indian Art and Industry.

MOGHUL COLOUR DECORATION OF AGRA.

ILLUSTRATED BY EXAMPLES FROM THE CHINI-KA-RAUZA, ITIMAD-UD-DAULAH'S TOMB, AND THE KANCH MAHAL.

By the late EDMUND W. SMITH, Esq., M.R.A.S.,
Archæologist to Government of India, N.W. Provinces.

As noted in the preceding number of this journal (in the description of Plates 133 and 134), the patterns on the panels depicted on Plates 135 and 136 are more realistic than many of those portrayed on the other panels, the leaves and flowers being arranged in graceful curves, so as to leave no gaping spaces so detrimental to good design. Plates 137 to 141 inclusive represent other panels ornamenting the north façade; whilst those numbered from 142 to 147 show some of the panels on the west or river front.

The panels shown on Plate 142 are immediately over the archway shown on Plate 146, above a doorway on the ground floor leading into a room on the north-west angle of the tomb. In design the panels given on Plate 145 are entirely different to those met with in other parts of the building. In both instances yellow vases upon a green background, edged with an engrailed border in dark crimson, take the place of the conventional flowers found upon the other panels, and in both cases an orange field has been employed round the upper part of the panels. In design the vases are unlike. One is broad and short-necked, whilst the other is like the *lotâ* or metal pot used by the natives of India for drinking purposes. In both cases the vases are filled with flowers. The short-necked vase stands in a white dish with yellow stripes. The lip of the jar is crimson, and round the neck and shoulder is a collar of white leaves studded with small flowers in blue and red, whilst the body of the vessel is ornamented with blue leaves. On each side of the vase is a double-handled water bottle (*surahi*) in light vermilion striped with white bands.

The *lotâ*-shaped vase on the other panel shown on Plate 145 is of an orange colour, with a white neck and a horizontal girdle of blue quatrefoils round the centre of the body.

Similar vases and bottles are very commonly used in the ornamentation found on Jahângîr's and Shâh Jahân's buildings, and may be seen on Itimâd-ud-daulah's tomb and many other buildings in Agra, but they are seldom seen on Moghul structures erected prior to Jahângîr's time. They are found on domestic buildings as well as upon tombs.

The great open arched entrance or vestibule spoken of before, in the centre of each façade, are ceiled by half domes (see Plate 117*a* in preceding number of this journal) which spring from the top of a deep cornice of a concave section.

The ground of the cornice (Plate 147) is divided into a series of long panels with scalloped or foiled ends, in orange-coloured tiles, enclosed by a narrow edging in blue and white, surrounded by a border of green inlaid with undulating floral scrolls in various colours. Flowers in blue, white and green, connected with tendrils spirally arranged, are let into the orange field of the panel, whilst in places leaves are curled round and turned over the blue and white edgings enclosing the panel.

The roofs of the arched entrances or vestibules are panelled and groined, and enriched with paintings all now more or less in a state of decay. In some instances the colours have disappeared altogether, and where this is so they have purposely been omitted and left out of the illustration (Plate 148).

The large arched vestibule in the centre of the four façades, spoken of in the last paragraph, lead into an octagonal cenotaph chamber in the centre of the tomb, 28 feet in diameter. The chamber, 37 feet in height, is domed over and is surmounted by a cupola standing on a sixteen-sided base. The exterior of the cupola was coated with blue and yellow tiles laid in diagonal bands. Round the upper side of the base of the cupola is a belt of variegated tiling, and beneath it is a string moulding, under which is a frieze band in the same material (see Plates 149 and 150). The designs employed are very much like some of those found in Sindh enamelled tiles, and it is not improbable that Sindh potters were employed on the decoration of the building.

But to return to the cenotaph chamber, four of the octagonal sides of the room are pierced by square doorways leading to the vestibules on the north, south, east and west sides of the tomb, whilst the remaining four are turned into recesses of pentagonal shape covered by half domes. The walls and ceilings of the chamber are coated in stucco, and are enriched from top to bottom with paintings of floral and other patterns.

In the crown of the dome is an exquisite medallion or centre-piece, the field of which is painted blue, and worked upon it are panels of flowers, chiefly in red and white, surrounded by narrow gold borders and garlands of white flowers and grapes. Surrounding the blue field is a broad star-shaped border in gold, of a concave section, enriched with floral ornamentation (Plate 151).

Below the medallion is the ceiling, corbelled out into five concentric honeycombed rings, beautified with flowers in gold and various colours (Plate 152); and from thence downwards to the springing of the dome it is richly groined and painted with conventional flowers, &c. (Plates 153 and 154).

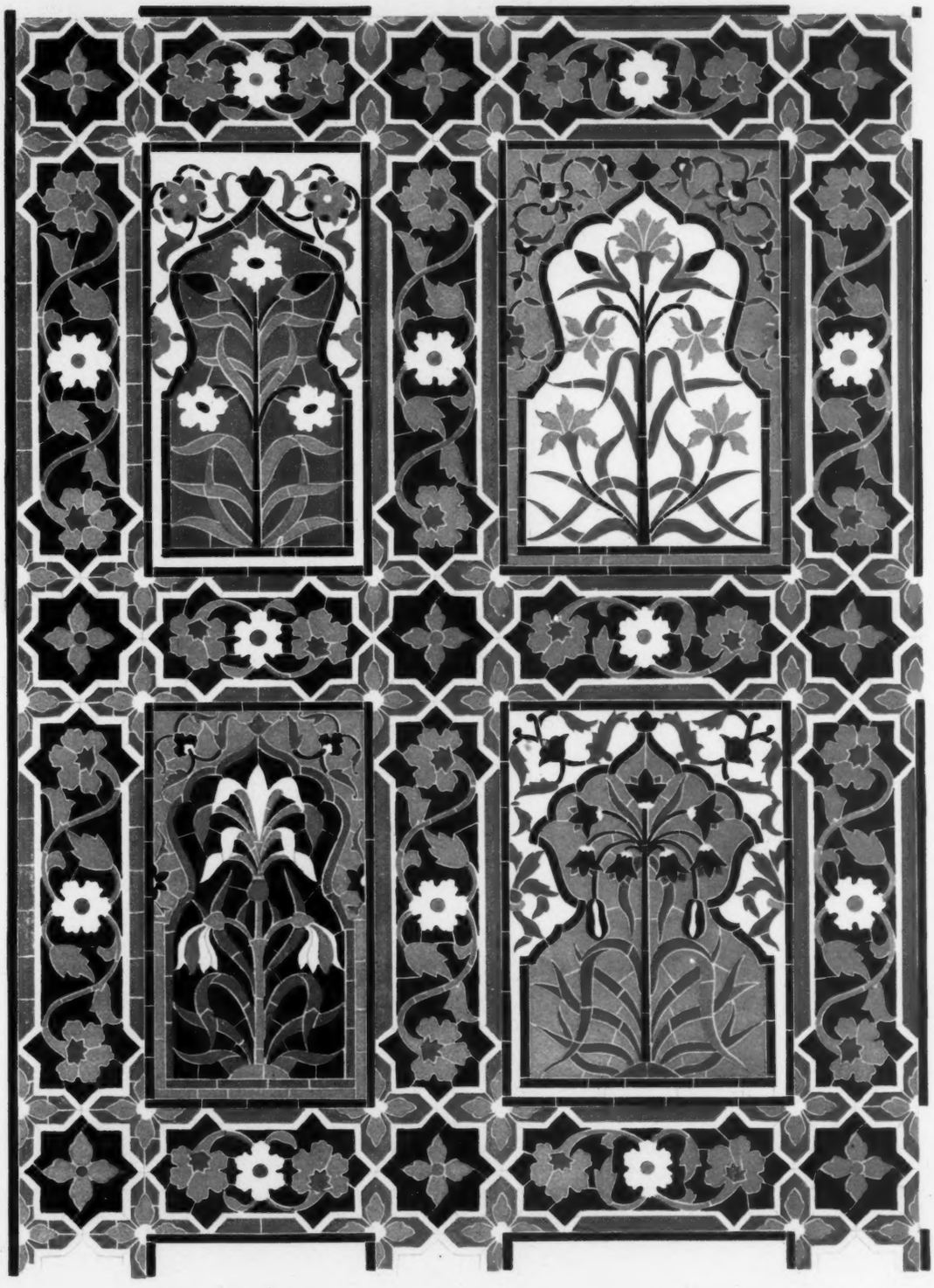
(*To be continued*).

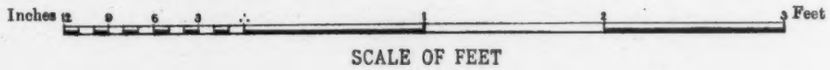
LIST OF ILLUSTRATIONS.

135 to 141. Tiled panels on the north façade. 142 to 146. Tiled panels on the west façade. 147. Western Vestibule: Tiling. 148. Western Vestibule: Colour decoration upon ceiling. 149. Detail of tiled frieze round base of the dome. 150. Detail of tiled cornice round base of the dome. 151. Colour decoration upon the medallion in the crown of the dome. 152 to 154. Colour decoration upon the soffit of the dome.

AGRA: CHÍNÍ-KA-RAUZA. TILED PANELS ON THE NORTH FAÇADE, EAST SIDE.

Marked H, H, on the Elevation.





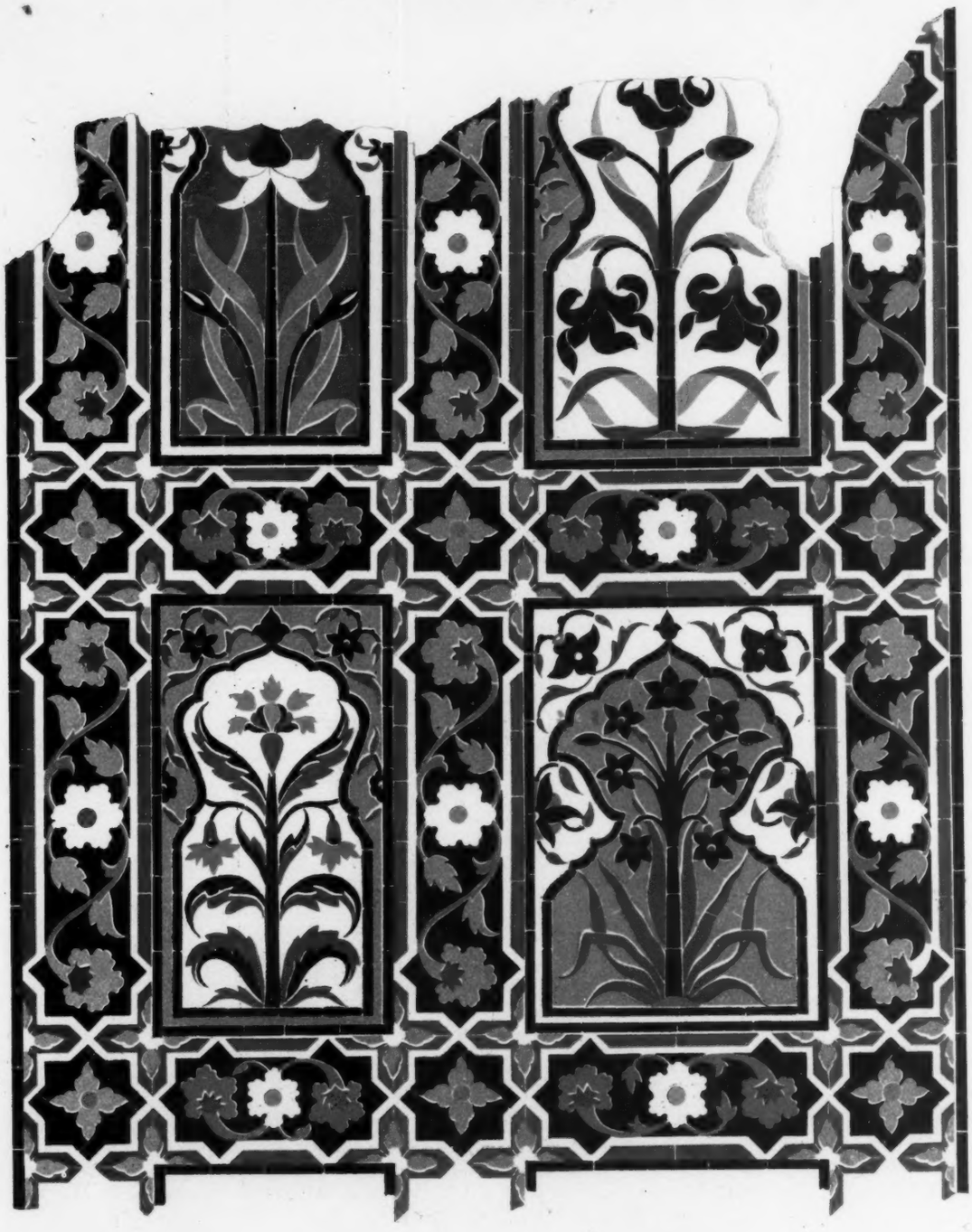
SCALE OF FEET

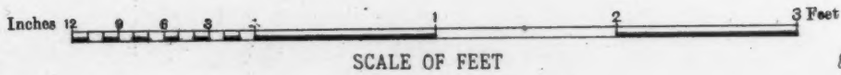
RAM PRATAP I. DEL.

Archæological Surveyor N.W.P.

AGRA : Chini-ka-Rauza. Tiled Panels on the North Façade, East Side.

Marked K, K, on the Elevation,





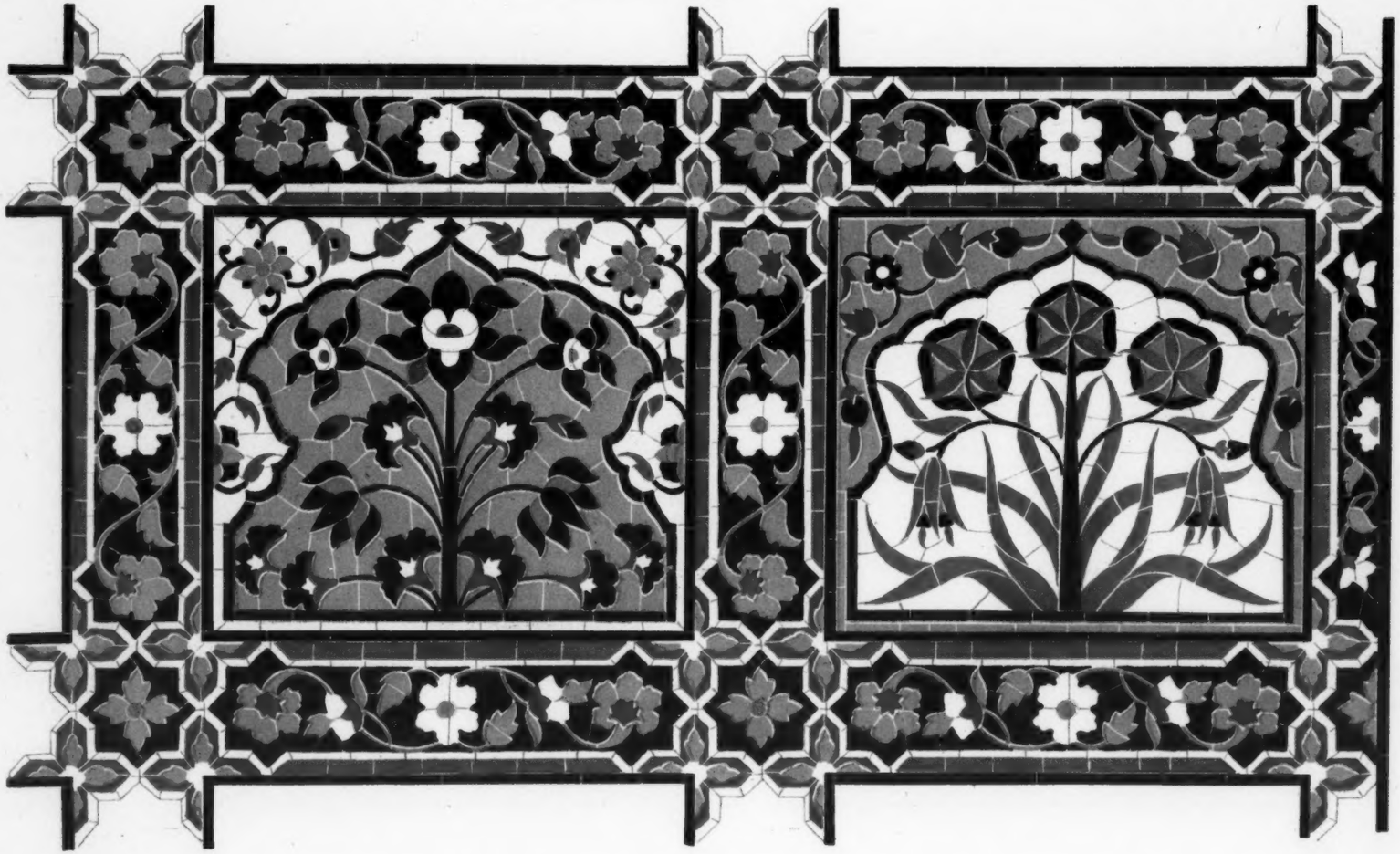
SCALE OF FEET

Edmd. W. Smith

Archæological Surveyor N.W.P.

AGRA: CHINÍ-KA-RAUZA. TILED PANELS ON THE NORTH FAÇADE, EAST SIDE.

Marked J, J, on the Elevation,



RAM SINGH, DEL.

Inches 12 6 1 2 3 Feet

SCALE OF FEET

Edwd. W. Smith

Archæological Surveyor N.W.P.

AGRA: Chînî-ka-Rauza. Tiled Panels on the North Façade, East Side.

Marked F, F, on the Elevation,

FAZL-UD-DIN II. DEL.

Inches 12 6 1 2 3 Feet

SCALE OF FEET

Edmd. Du Cane

Archæological Surveyor N.W.P.

AGRA: CHÍNÍ-KA-RAUZA. TILED PANELS ON THE NORTH FAÇADE, EAST SIDE.

Marked G, G, on the Elevation.

RAM SINGH & FAZL-UD-DIN I. DEL.

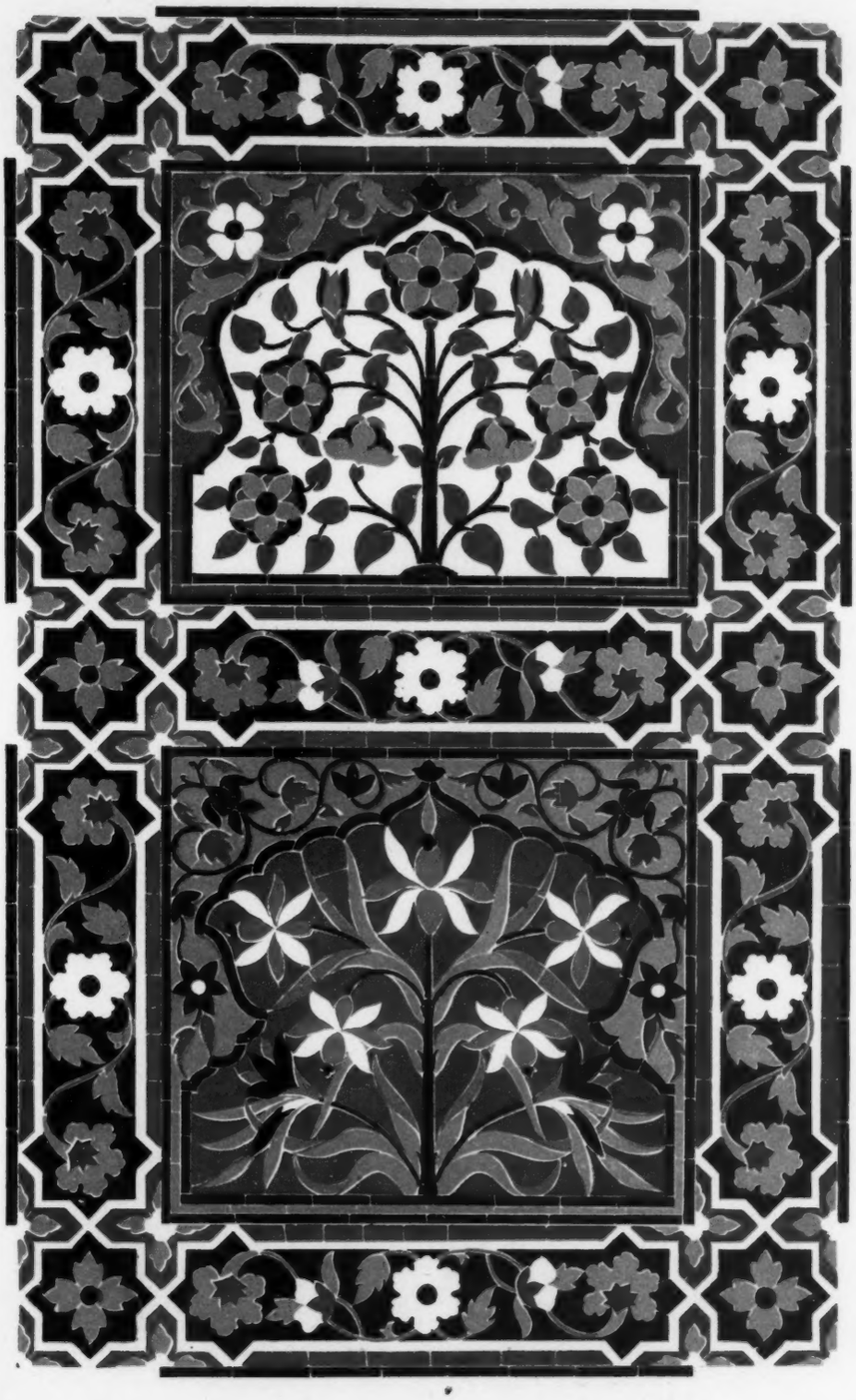
Inches 12 9 6 3 0 1 2 3 Feet

SCALE OF FEET

Archæological Surveyor N.W.P.

AGRA: Chînî-ka-Rauza. Tiled Panels on the North Façade, East Side.

Marked C, C, on the Elevation,



SCALE OF FEET

Edmd W. Smith

Archæological Surveyor N.W.P.

AGRA : Chînî-ka-Rauza. Tiled Panels on the North Façade, East Side.

Panels marked D, D, on the Elevation,

FAZL-UD-DIN II. DEL.

Inches 12 9 6 3 0 1 2 3 Feet

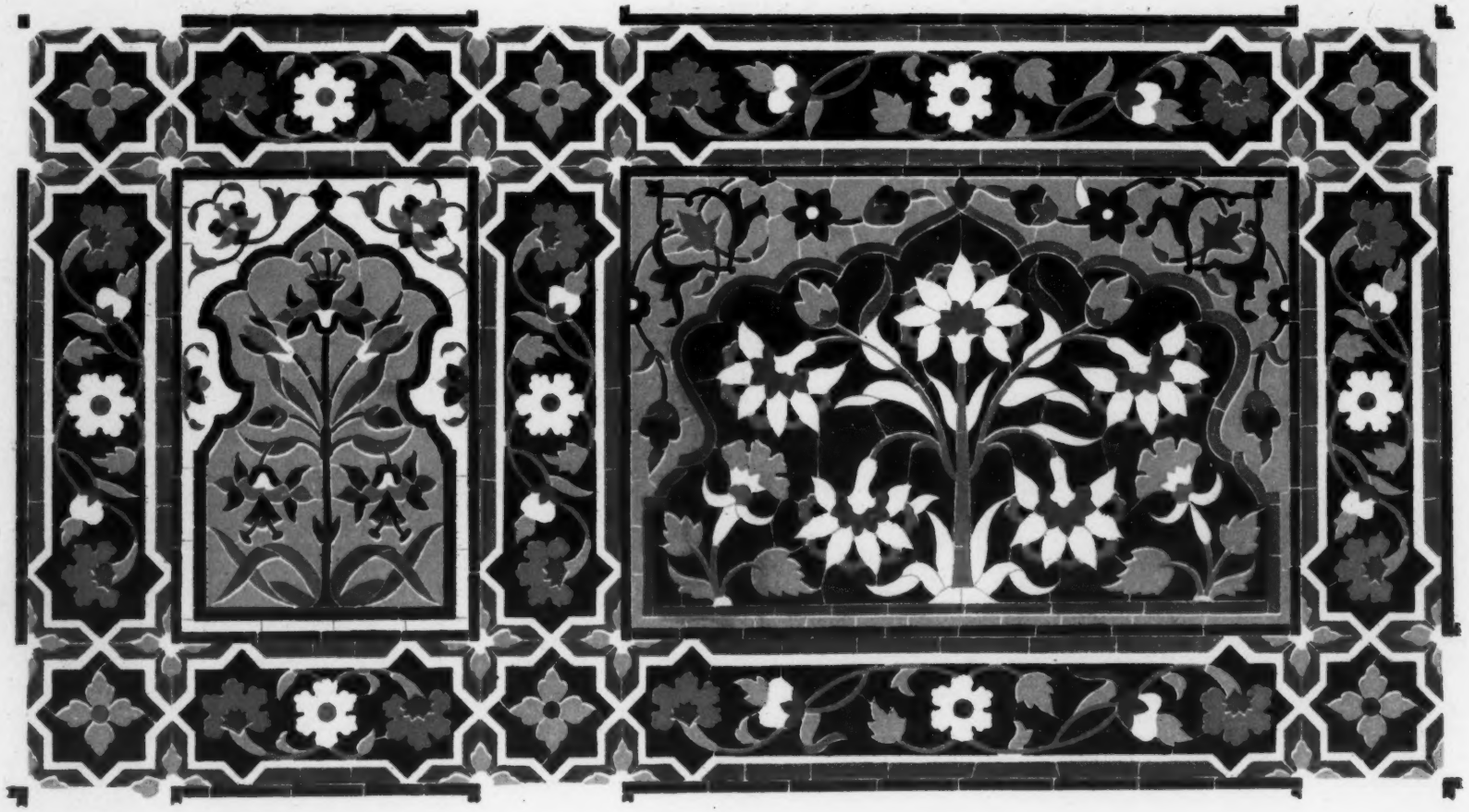
SCALE OF FEET

Edward W Smith

Archæological Surveyor N.W.P.

AGRA : CHÎNÎ-KA-RAUZA. TILED PANELS ON THE WEST FAÇADE, NORTH END.

[Over the ground floor doorway].



SOHUN LAL, DEL.

Inches 12 9 6 3 1 2 3 Feet

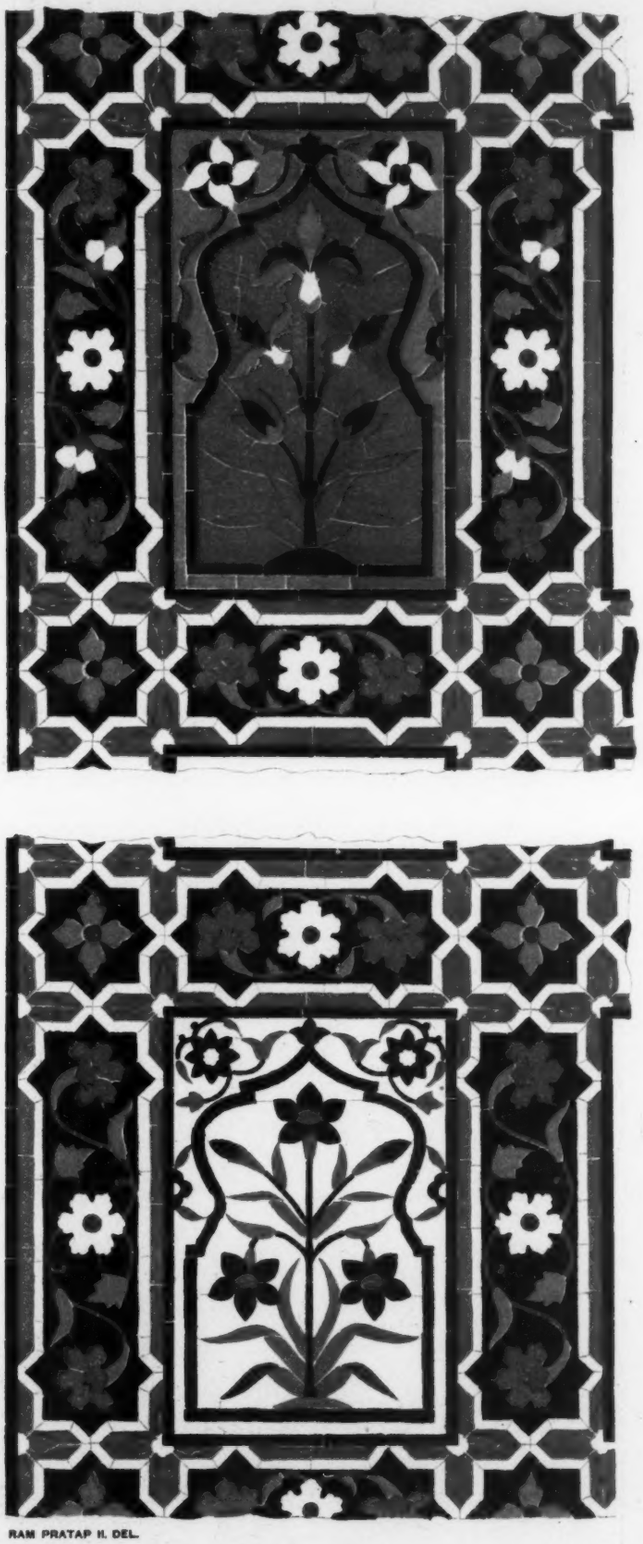
SCALE OF FEET

Edmund W. Smith

Archæological Surveyor N.W.P.

AGRA : CHÎNÎ-KA-RAUZA. TILED PANELS ON THE WEST FAÇADE, NORTH END.

[On the side of the Northern entrance].



RAM PRATAP II. DEL.

Inches 2 1 0 1 2 3 Feet

SCALE OF FEET

Archæological Surveyor N.W.P.

AGRA: Chînî-ka-Rauza. Tiled Panels on the West Façade, North End.

[Below the first floor window]

FAZL-UD-DIN IL DEL.

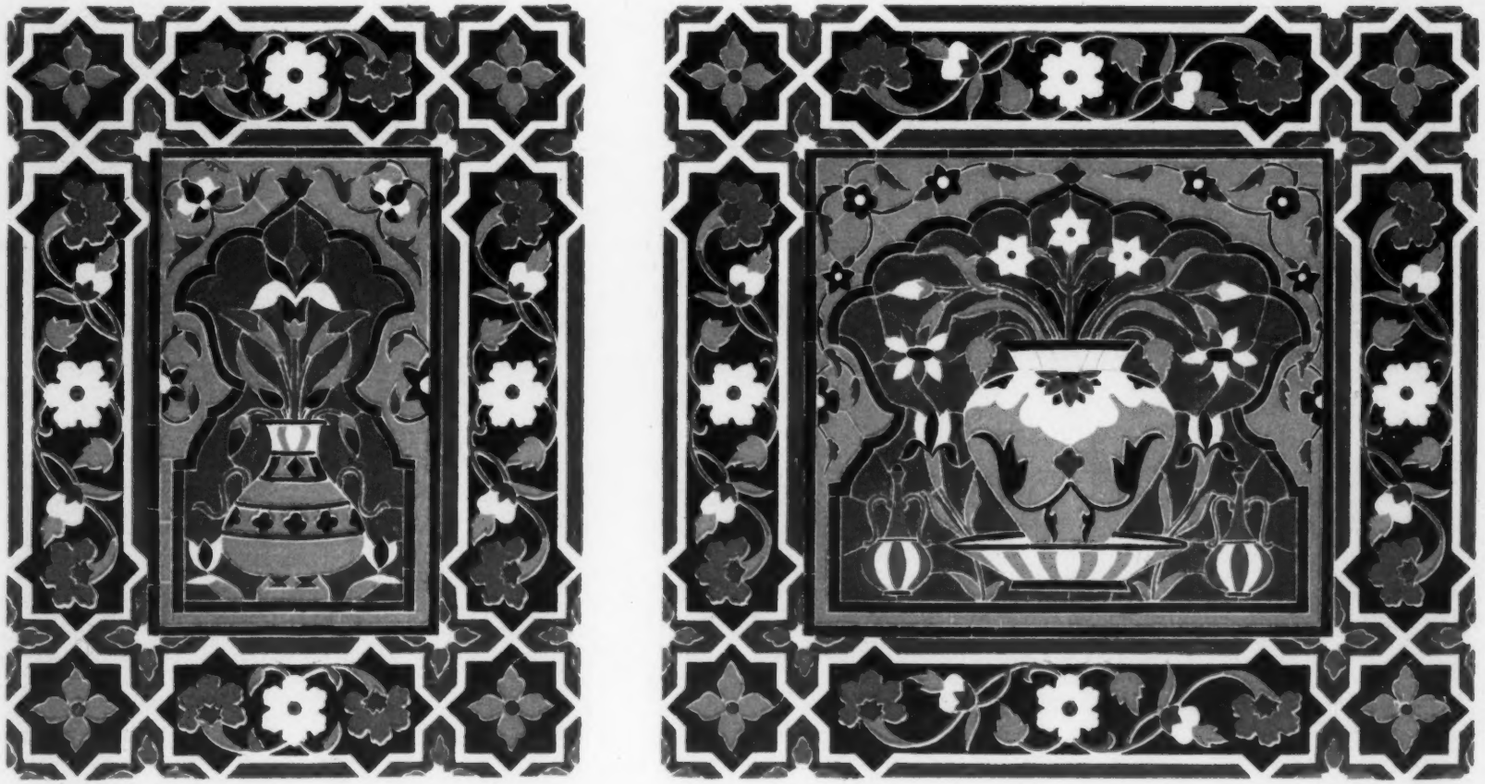
Inches 12 9 6 3 0 1 2 3 Feet

SCALE OF FEET

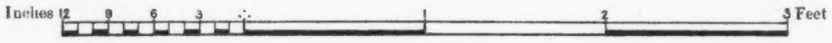
Archæological Surveyor N.W.P.

AGRA : Chíní-ka-Rauza. Tiled Panels on the West Façade, North End.

[On the sides of the first floor windows—below the cornice].



RAM PRATAP I. & SOHUN LAL, DEL.



SCALE OF FEET

Edward Balfour

Archæological Surveyor N.W.P.

AGRA: CHÎNÎ-KA-RAUZA. TILED PANELS ON THE WEST FAÇADE, NORTH END.

[Archway over the ground floor doorway].

SOHUN LAL, DEL.

Inches 0 6 1 2 3 Feet

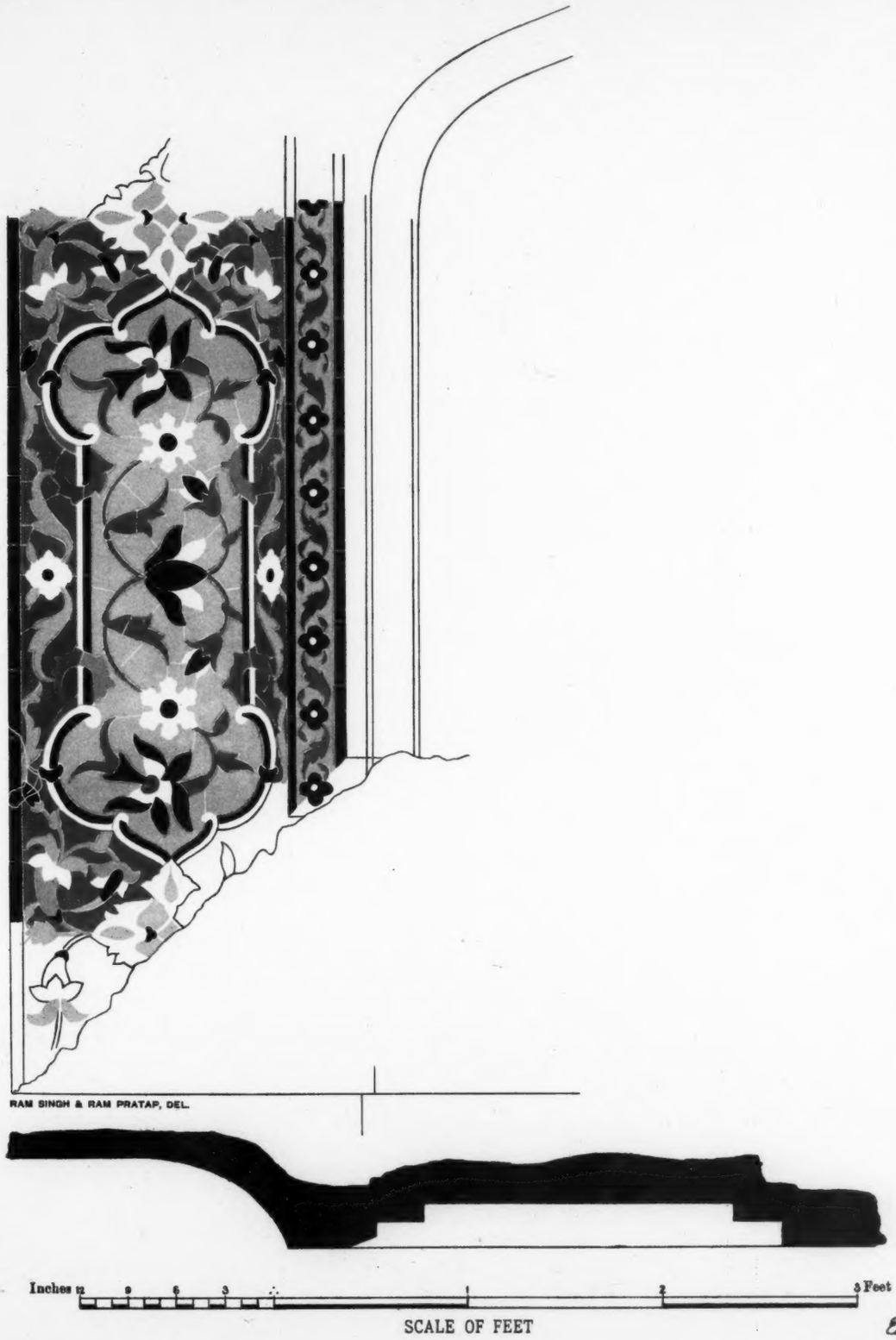
SCALE OF FEET

Edmund W. Smith

Archæological Surveyor N.W.P.

AGRA: Chînî-ka-Rauza. The Western Vestibule.

Tiling upon the cornice and intrados of the main archway.

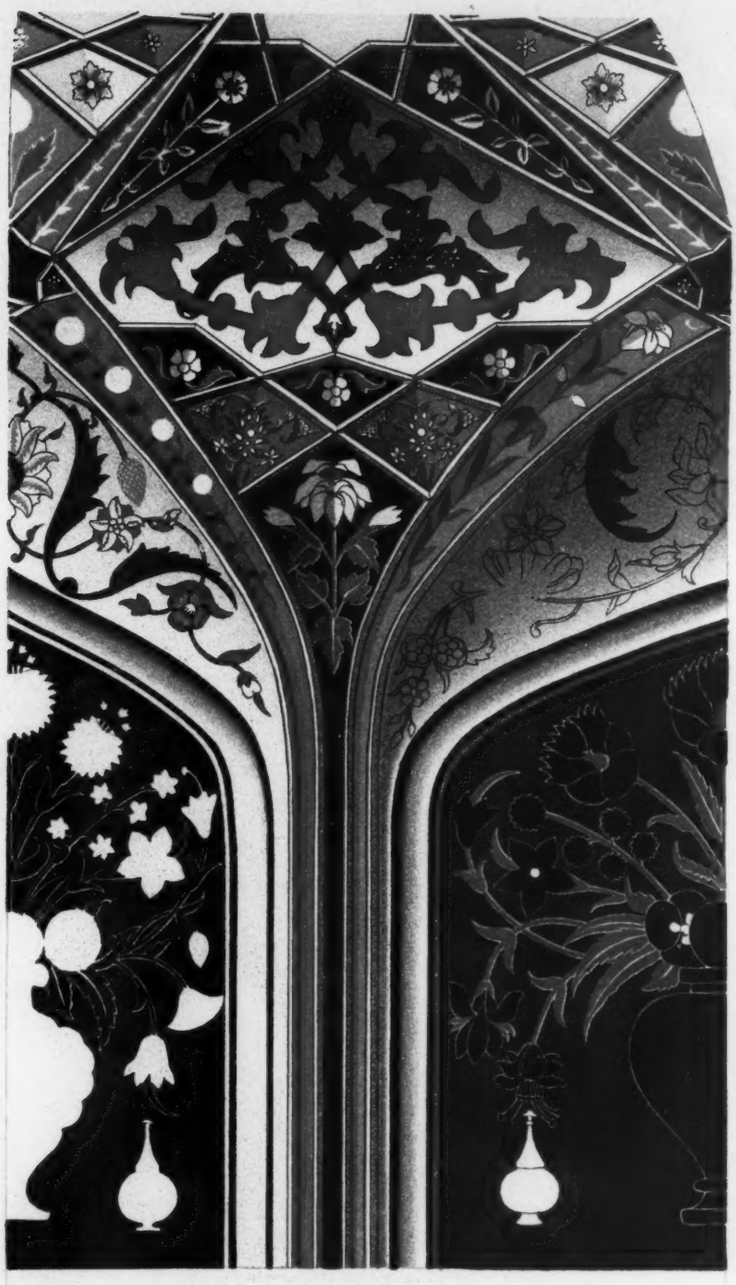


SCALE OF FEET

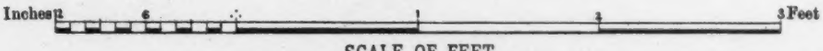
Archæological Surveyor N.W.P.

AGRA : CHÎNÎ-KA-RAUZA. THE WESTERN VESTIBULE

Colour Decoration upon the ceiling.



SOHUN LAL, DEL



SCALE OF FEET

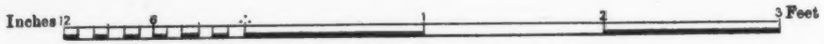
Edmund Smith

Archæological Surveyor N.W.P

AGRA : Chíní-ka-Rauza. Detail of Tiled Frieze round the Base of the Dome.

RAM PRATAP I. DEL.

Section

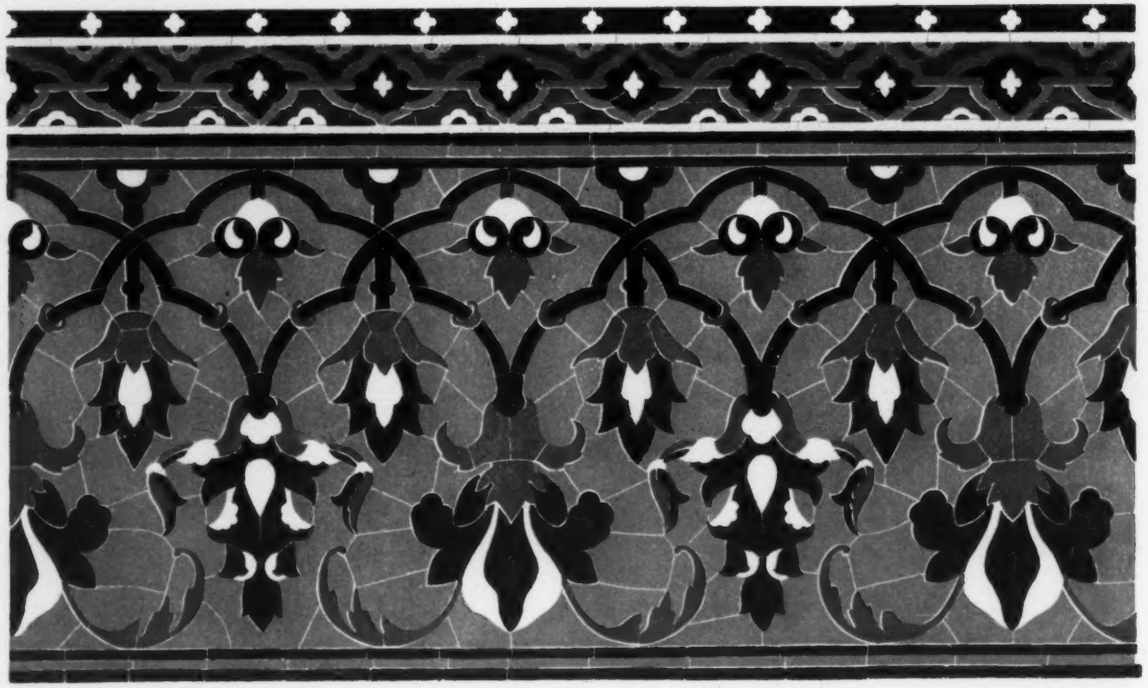


SCALE OF FEET

Edwd. A. Smith

Archæological Surveyor N.W.P.

AGRA: Chînî-ka-Rauza. Detail of Tiled Cornice round the Base of the Dome.



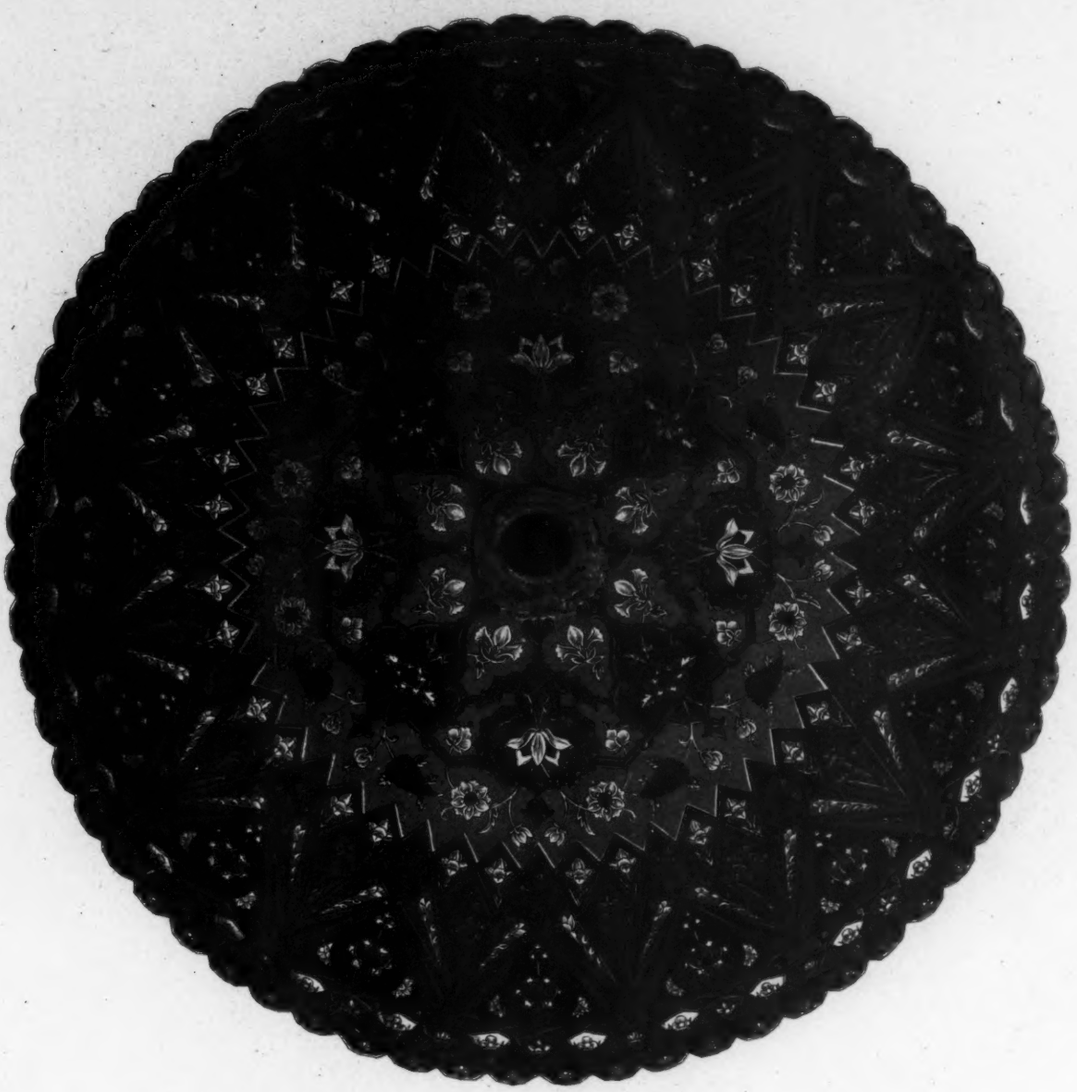
Section

Inches 12 6 1 2 3 Feet

SCALE OF FEET

Edmund W. Smith
Archæological Surveyor N.W.P.

AGRA: CHÎNÎ-KA-RAUZA. COLOURED DECORATION UPON THE MEDALLION IN THE CROWN OF THE DOME.



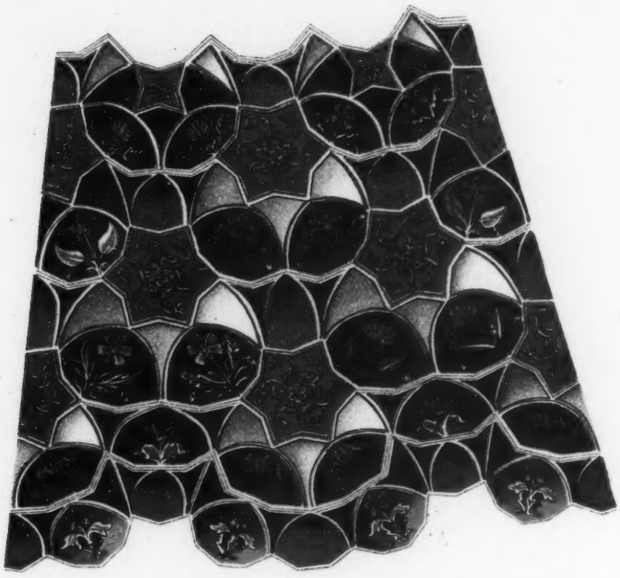
BHAIRAV BAKHSH, DEL. Section Edwd. W. Smith

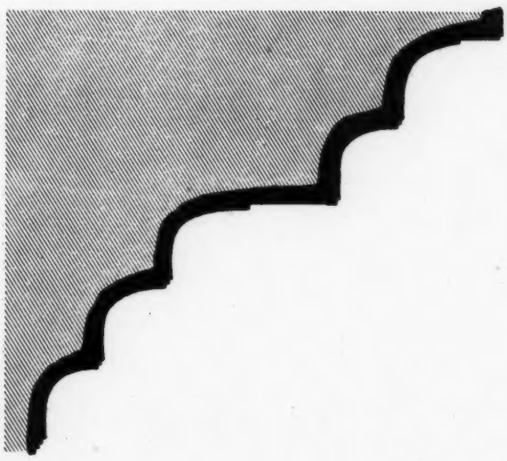
Inches 12 1 2 3 4 5 6 7 8 9 Feet

SCALE OF FEET

Archæological Surveyor N.W.P.

AGRA : CHÎNÎ-KA-RAUZA. COLOURED DECORATION UPON THE SOFFIT OF THE DOME.





Section

Elevation

BHAIRAV BAKSH, DEL.

Inches 12 6 1 2 3 4 Feet

SCALE OF FEET

Edward W. Smith

Archæological Surveyor N.W.P.

AGRA : CHINÍ-KA-RAUZA. DETAIL OF COLOUR DECORATION UPON THE SOFFIT OF THE DOME (SPRINGING).

BHAIRAV BAKHSH, DEL.

Inches 0 1 2 3 Feet

SCALE OF FEET

Edmd. W. Smith

Archæological Surveyor N.W.P.

AGRA : CHÎNÎ-KA-RAUZA. COLOUR DECORATION UPON THE SOFFIT OF THE DOME (SPRINGING).

BHAIRAV BAKHSH & RAM SINGH, DEL.

Inches 12 9 6 3 ∴ 1 2 3 Feet

SCALE OF FEET

Edmd. W. Smith

Archæological Surveyor N.W.P.

The Journal of Indian Art and Industry.

MOGHUL COLOUR DECORATION OF AGRA.

ILLUSTRATED BY EXAMPLES FROM THE CHINI-KA-RAUZA, ITIMAD-UD-DAULAH'S TOMB, AND THE KANCH MAHAL.

By the late EDMUND W. SMITH, Esq., M.R.A.S.

Archæologist to Government of India, N.W. Provinces.

The vaulting of the dome springs from a bold cornice of a concave shape. As Plate 155 shows, the ground of this is painted a deep chocolate, and upon it repose rich scrolls in light blue and a deeper shade of chocolate, enriched with floral wreaths in gold and green. The nose of the cornice is flat, and the face is coloured a rich dark blue bordered with narrow bands of gold. Upon the blue ground is an undulating scroll in white and gold.

As previously mentioned, the sides of the octagonal chamber below the dome are deeply recessed from the face of the main wall of the room. The recesses on four of the sides of the chamber are square on plan, and lead to doorways admitting to vestibules beyond, and the other four are pentagonal in shape. All of the recesses are arched at the top, and the spandrils of the arches are most exquisitely and chastely painted with arabesques in rich and beautiful colours. The designs are varied, those in the spandrils in front of the pentagonal recesses being different to those upon the spandrils over the four arches in front of the square recesses.

The spandrils are plastered, and the ornamentation on four of them is raised about a quarter of an inch from the surface (Plate 156), whereas in the other cases it is painted on the surface of the plaster itself. Where this is the case, the faces of the spandrils are painted white (Plate 157), but where the ornamentation is raised they are coloured Indian red.

Painted in the middle of the spandrils are blue plaques or tablets edged with leaves, inscribed in Arabic characters; in some cases with the name of God (Allah), and in others with that of Muhammad. Surrounding and flowing from the outer rim of the inscribed tablets, and completely filling up the fields of the spandrils, are graceful floral scrolls, which in some instances are gilded, whilst in others they are painted in a variety of colours. The outer edges of the spandrils are splayed and are decorated with a creeper pattern in gold and white upon a deep blue ground enframed by gilded tooth-moulded borders.

The face of the wall above the top of the spandrils, and the cornice (before described) below the springing of the dome covering the chamber, are sunk out with oblong-shaped panels, which are filled up with Arabic texts in raised Tughra characters. As Plate 157 shows, the characters are gilded, whilst the background of the panels is painted blue. The panels are enclosed by chocolate-coloured borders enriched with floral ornamentation, which continue down and enclose the outer sides of the spandrils.

The soffits, or ceilings of the recesses, are most beautifully groined and decorated in rich colours in keeping with the rest of the chamber. An illustration of one of the ceilings is presented on Plate 158, from which the style of decoration may be studied.

Unfortunately, for some years the Chînî-kâ-Rauzâ was occupied by a native cultivating the land adjoining the tomb, who, regardless of the beautiful decoration upon the walls and ceilings, lighted his fires and cooked his food inside the rooms, with the result that much of the decoration has been irreparably spoilt and damaged. For years the tomb was in a shocking state of dilapidation. Little or nothing was done to preserve it, and visitors used to hack off pieces of the beautiful tiling from the outside walls and carry them away to distant homes as souvenirs of the place. The writer called the attention of Government to the state of affairs, who took the matter up, with the result that the tomb is now protected and well cared for. It has been enclosed by a railing, and the enclosure between the railing and the tomb has been neatly planted with shrubs. As far as possible, the tomb has been repaired structurally to arrest further decay, but no renovation or restoration has been attempted. The tomb bears no inscription, and it is not known for whom it was built; but traditionally it is ascribed to 'Afzal Khân, a poet, who died at Lâhôr in A.D. 1639.

Similar tiling to that used for ornamenting the exterior of the Chînî-kâ-Rauzâ (described in Parts 78 and 79 of this journal) was employed for covering the outside of the kiosques round the third floor of Akbar's tomb at Sikandrâ (see Plate 159), commenced by Akbar himself, but completed by his son Jahângîr between A.D. 1605 and 1615. Examples of these tiles are illustrated on Plates 160 to 164. Plate 160, fig. 1, shows the manner in

which the tiles are laid upon the cupolas of the kiosques, and Plates 161, 162, 163, and 164 show the designs in detail.

In most cases star patterns, surrounded or combined with hexagonal and other geometrical figures, have been used. In some places, portions of the patterns have decayed and have been replaced by tiles of a totally different design (Plate 162). Most of the designs are geometrical, but in some cases floral patterns have been introduced (see figs. 1 and 2, Plate 161, and fig. 1, Plate 163). On one of the cupolas we find the ancient *swastika* worked in, in white (Plate 161, fig. 3) upon a blue ground, in the centre of a star, the points of which are green.

There is another building at Sikandrâ where encaustic tiling was used by the Moghuls for decorative purposes. It is situated a little to the east of Akbar's tomb, within a walled garden, and was built as a residence by Jahângîr (so it is said) for his queen Jôdh Bâî. Without exception, it is one of the finest specimens of Moghul domestic architecture in the district.

Exteriorly it measures 52 feet 10 inches by 45 feet 2 inches, and is two storeys high. On the ground floor is a large central hall, 16 feet square, with three rooms on both the east and west sides. Above them, on the upper floor, are other rooms, which look out into the upper of the central hall, which is open from the ground floor to the roof.

The rooms on the north-east and north-west corners of the building have bay windows in them which command a view of Akbar's tomb. They are of a semi-hexagonal shape, and are carried on beautifully carved stone corbels. The sides of the bays are filled in with geometrical stone tracery, and are roofed by semi-domes which are ornamented on the outside with enamelled tiling similar to that found upon the Chînî-kâ-Rauzâ and the kiosques round the upper part of Akbar's tomb (Plate 170). The parapet round the top of the building, and the cornice beneath it are ornamented throughout with tiling (Plate 171), and the same material is used in the top of some square-headed windows on the east and west sides of the building.

In the first part of this paper (Vol. IX, No. 78) it was stated that from Jahângîr's time, in addition to other methods, the Moghul architects relied extensively upon mosaic ornamentation in "pietra-dura" for the decoration of their buildings. We find this exemplified in the tomb of Itimâd-ud-daulah, Agrâ, reference to which has already been made in this journal (Vol. VI, Nos. 46-53, pp. 91-94).

Itimâd-ud-daulah, it may be remembered, was the father of Nûr Jahân, the wife of the emperor Jahângîr. He came originally from Teheran, in Persia, as an adventurer to seek his fortune in India, and was known as Ghiâs Beg. He appears to have been introduced to Akbar's court at Fathpur Sikri, and rose by his ability and industry from one post to another, until he was eventually promoted to the position of Itimâd-ud-daulah, or High Treasurer; and on the marriage of his daughter Mihrunnisâ (the future Nûr Jahân) with Jahângîr, he became *Vakil-i-Kul*, or Prime Minister. His daughter was a highly gifted and talented woman, and possessed immense power during her husband's lifetime; but with his death her influence ceased, and on the accession of Shâh Jahân she retired from the worries of State affairs, and was allotted a liberal pension of two lakhs of rupees per annum. Itimâd-ud-daulah died in 1622, and his daughter devoted her time to building his mausoleum, which was completed about the year 1628.

Like the Chînî-kâ-Rauzâ, the tomb stands in the midst of a large garden, some 180 yards square, surrounded by a wall, except on the west or river side, where there is a terrace. The entrance to the garden is on the east side through a red sandstone gateway, ornamented with marble mosaics.

The tomb (Plate 165) stands on a high plinth and is of a rectangular shape, measuring 69 feet each way. In the centre of the building is a large domed chamber containing Ghais-ud-din's and his wife's tomb, and on the four corners are other mortuary chambers connected by vestibules opening out into the garden. Over the domed chamber is an upper storey, in which there are two white marble cenotaphs. They are surrounded by red marble borders (Plate 167, fig. 1) inlaid with scrolls in bluish-black slate, looped together with small rosettes in white and a mottled marble called *abri*, which comes from Jesalmer in Rajputana.

The tombs in the crypt, as well as the cenotaphs, lie north and south, according to the usual custom, but they are not in the centre of the chambers, as may be seen from Plate 166. The floor round the cenotaphs is of marble mosaic. The ground is of white marble, and inlaid upon it are leaf and floral scrolls in variegated marbles. Surrounding the floor is a broad border composed of leaves in black stone and jasper worked into a chain pattern. A diagram of the border is presented on Plate 167, fig. 2.

Plate 168 is a drawing of the inlaid ornamentation upon the plinth upon which the cenotaph chamber stands, and Plate 169 shows the nature of the inlaid ornamentation upon the upper part of the towers upon the angles of the building (Plate 165). The towers contain staircases leading from the ground floor to the cenotaph chamber,

and, in keeping with the rest of the building, are inlaid from top to bottom with geometrical and floral designs in marble mosaics.

Previous to Jahângîr's time little in the way of mosaic ornamentation had been attempted by the Moghul architects. We meet with it occasionally in Akbar's buildings at Faṭhpûr Sîkrî, erected more towards the close of his reign; but it was not until Jahângîr's reign that it was extensively employed and became one of the characteristic features of the Moghul style. We see it extensively used upon the gate entrances to the grounds round Akbar's tomb at Sikandrâ, erected during the first ten years of Jahângîr's reign, A.D. 1605-1615. In Itimâd-ud-daulah's tomb (1615-1628) we have both mosaic work in coloured marbles and inlaid work, but after Jahângîr's time the mosaic ornamentation gave place entirely to, and was supplanted by, inlaid decoration in "pietra-dura." The finest specimens of this style of decoration are to be seen in the famous Tâj and the Moghul palaces at Agra, and Shâh Jahân's buildings at Delhi.

It was prior to Shâh Jahân's time that the inlaid style of ornamentation called "pietra-dura" came into vogue and was extensively used in Florence and other places in Europe, and it is generally thought it was introduced from Italy by the Italian artists in Shâh Jahân's service.

Like the Chînî-kâ-Rauzâ and Akbar's tomb at Sikandrâ, the interior of Itimâd-ud-daulah's tomb is richly ornamented with paintings chiefly of a floral nature, but as these have already been referred to in Vol. VI, Nos. 47 and 49, of this journal, it is hardly necessary to allude to them again here.

It is unknown where the tiles ornamenting the Chînî-kâ-Rauzâ were manufactured. Probably potters cunning in the art of tile-making were brought from Sindh or the Panjâb to Agrâ for the work, as most of the colours found in these Provinces are met with in the panels upon the walls of the Chînî-kâ-Rauzâ.

Sir George Birdwood has devoted a chapter or so to the manufacture of Indian encaustic tiles and pottery in his book entitled *Industrial Arts of India*, and any reader wishing to study the subject further is referred to the work.[1]

[1] *Industrial Arts of India*, by Sir George Birdwood, pp. 304 *et seq.* Published at London in 1880.

LIST OF ILLUSTRATIONS.

155. Decorated cornice round the interior of the cenotaph chamber (Chînî-kâ-Rauzâ). 156, 157. Decorated spandril over the arched recesses on the ground floor of the cenotaph chamber. 158. Painted decoration upon the soffits of the angle bays or alcoves in the corners of the cenotaph chamber. 159. Akbar's Tomb, Sikandra. 160 to 164. Tiled ornamentation upon the kiosques round the third floor. 165. Exterior of Itimâd-ud-daulah's Tomb. 166. Mosaic pavement, upper floor. 167. Details of mosaic borders round the cenotaphs. 168. Inlaid ornamentation upon the plinth of the upper floor. 169. Inlaid ornamentation upon the upper part of the turrets upon the angles of the building. 170. Kânch Mahal: Detail of upper part of bay windows. 171. Detail of main cornice, &c.

AGRA : CHÍNÍ-KA-RAUZA. DETAIL OF DECORATED CORNICE ROUND THE INTERIOR OF THE CENOTAPH CHAMBER.

Section

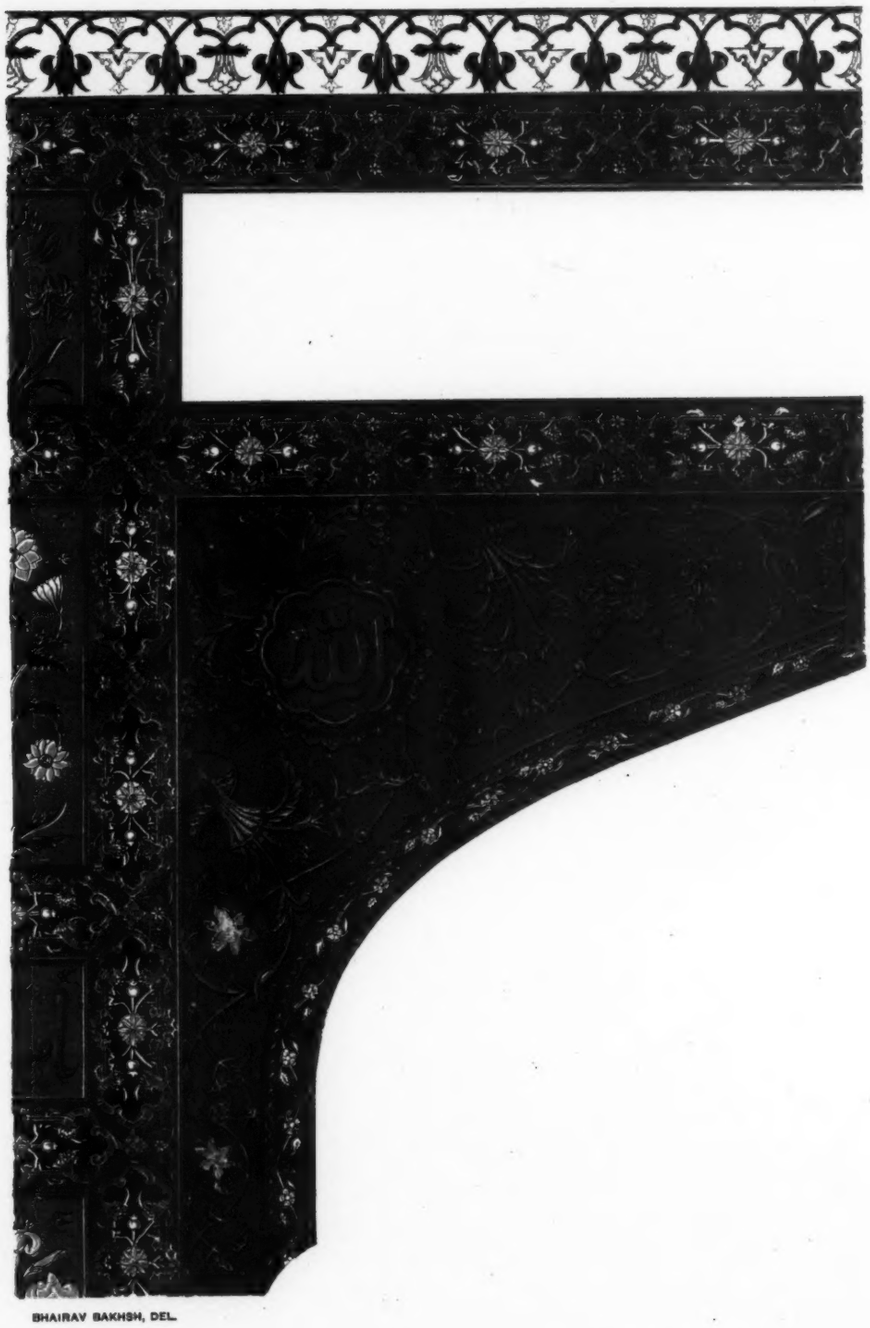
Inches 0 6 1 2 3 Feet

SCALE OF FEET

Edwd. W. Smith

Archæological Surveyor N.W.P.

AGRA : Chînî-ka-Rauza. Decorated Spandrils over the arched recesses on the Ground Floor of the Cenotaph Chamber.



BHAIRAV BAKHSH, DEL.

Inches 0 6 1 2 3 Feet

SCALE OF FEET

Edmd. W. Smith

Archæological Surveyor N.W.P.

AGRA : Chînî-ka-Rauza. Decorated Spandrils over the arched recesses on the Ground Floor of the Cenotaph Chamber [A]

Section

Edwd. W. Smith

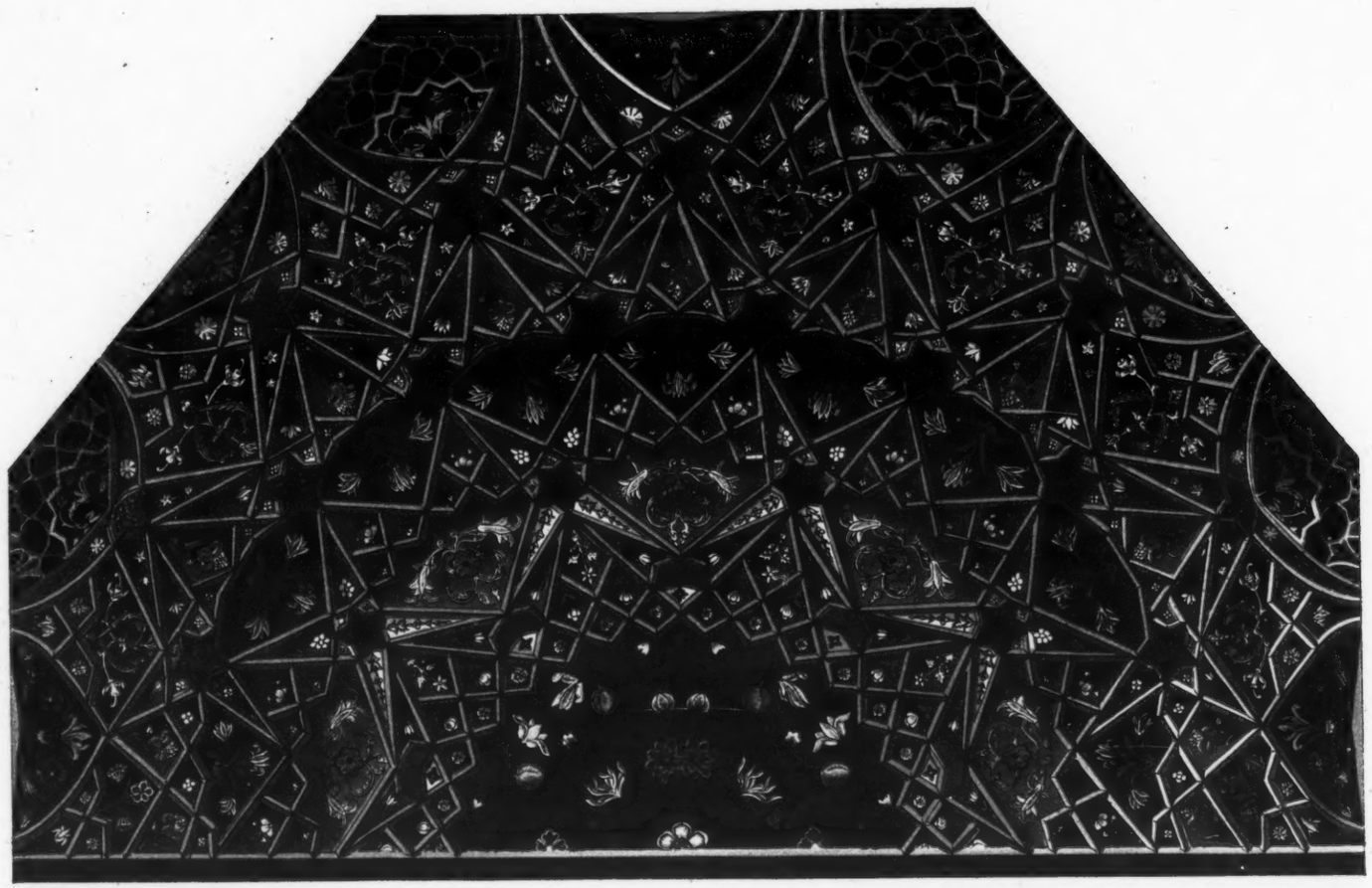
Archæological Surveyor N.W.P.

Inches 0 1 2 3 1 2 Feet

SCALE OF FEET

BHAIRAV BAKHSH & RAM PRATAP, DEL.

AGRA: Chînî-ka-Rauza. Painted Decoration upon the Soffits of the Angle-bays, or Alcoves, in the corners of the Cenotaph Chamber.



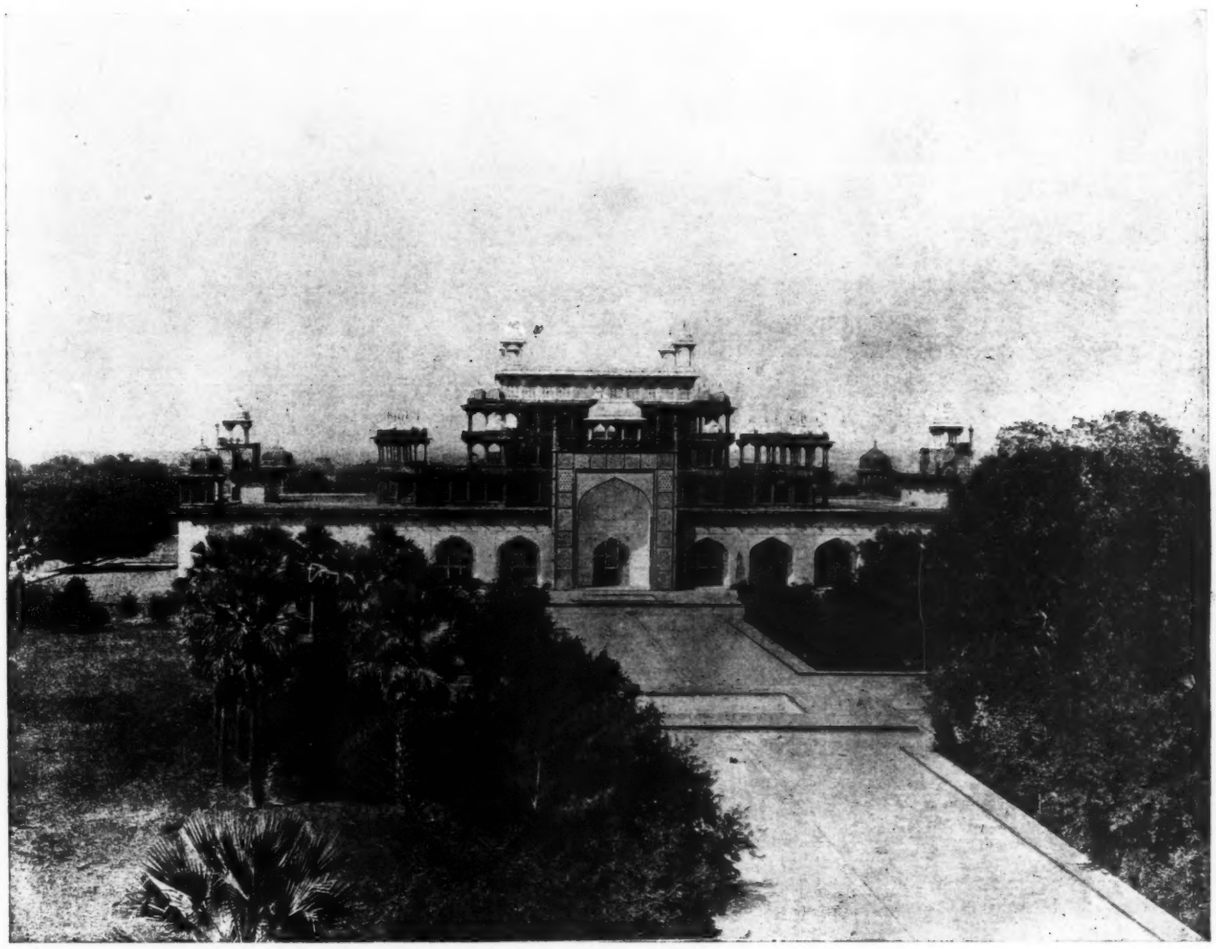
RAM SINGH & BHAIRAV BAKHSH, DEL.

Edmd. W. Smith

Archæological Surveyor N.W.P.

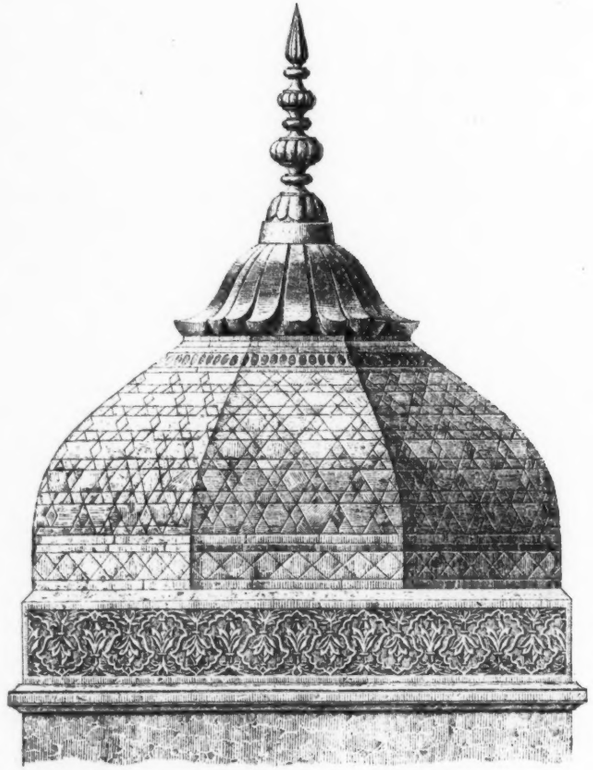
Inches 12 9 6 3 0 1 2 3 Feet

SCALE OF FEET

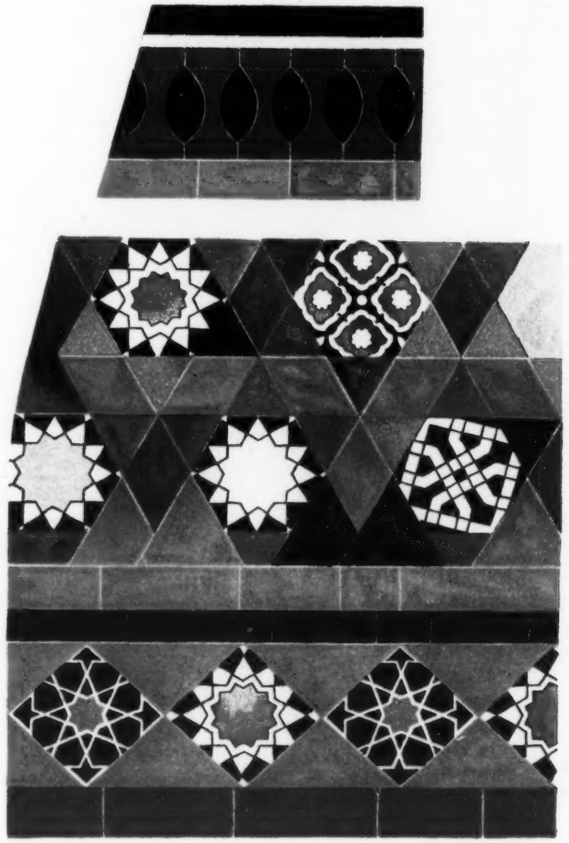


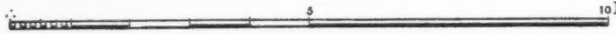
159.—Sikandra, Agra: General View of Akbar's Tomb from the South.

SIKANDRA : AKBAR'S TOMB. TILED ORNAMENTATION UPON THE KIOSQUES ROUND THE THIRD FLOOR.

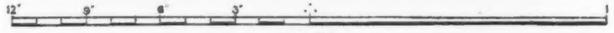


FAZL-UD-DIN I.
BHAIRAV BAKSH.





SCALE OF FEET



SCALE

Edmd. W. Smith

Archæological Surveyor N.W.P.

SIKANDRA: AKBAR'S TOMB. TILED ORNAMENTATION UPON THE KIOSQUES ROUND THE THIRD FLOOR.

Fig. 2.

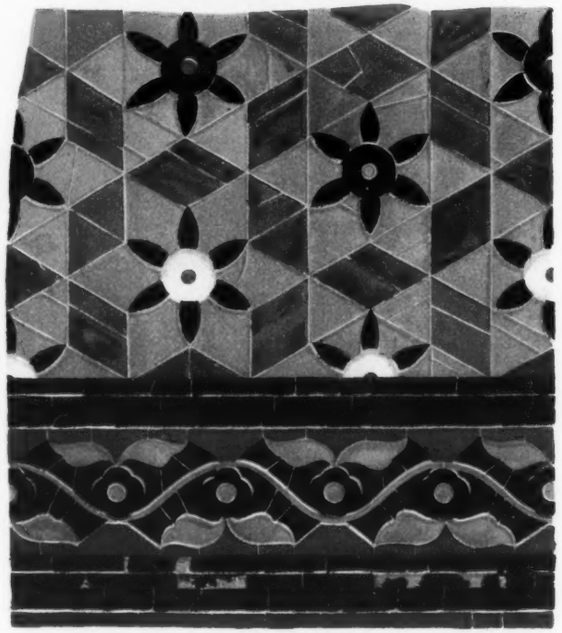


Fig. 1.

Fig. 3.

Fig. 4.

Inches 12 9 6 3 1 Foot

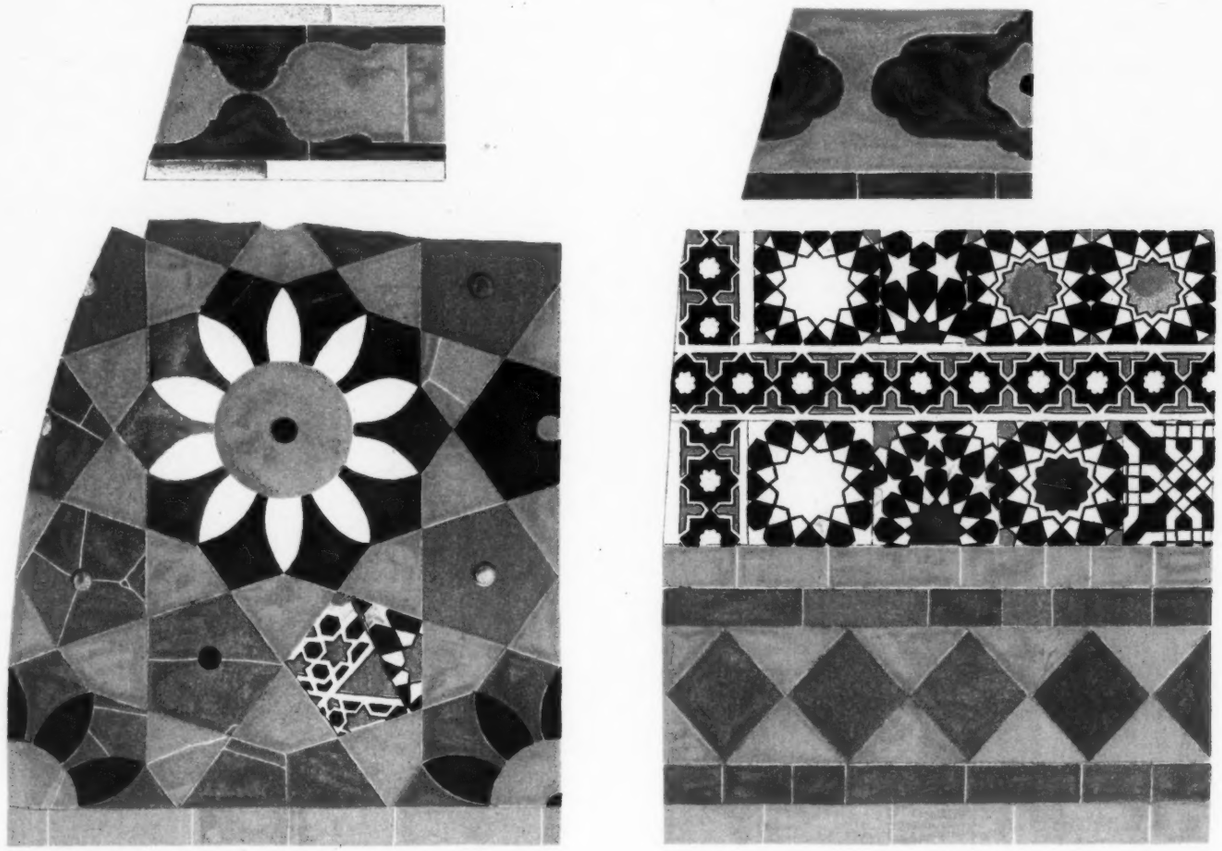
SCALE

Edwd. Wo. Smith

Archæological Surveyor N.W.P.

BHAIRAV BAKHSH & FAZL-UD-DIN II. DEL.

SIKANDRA: AKBAR'S TOMB. TILED ORNAMENTATION UPON THE KIOSQUES ROUND THE THIRD FLOOR.



BHAIRAV BAKHSH & FAZL-UD-DIN II. DEL.

Inches 12 9 6 3 0 1 Foot

SCALE

Edwin W. Smith

Archæological Surveyor N.W.P.

SIKANDRA: AKBAR'S TOMB. TILED ORNAMENTATION UPON THE KIOSQUES ROUND THE THIRD FLOOR.

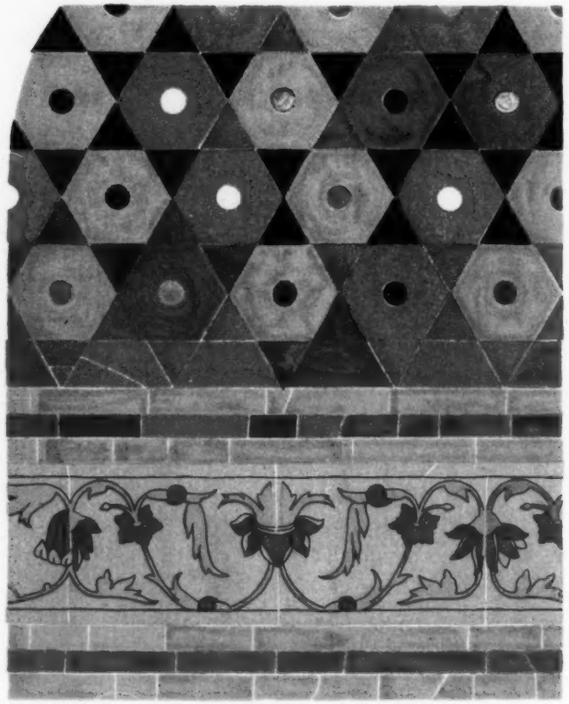


Fig. 1.

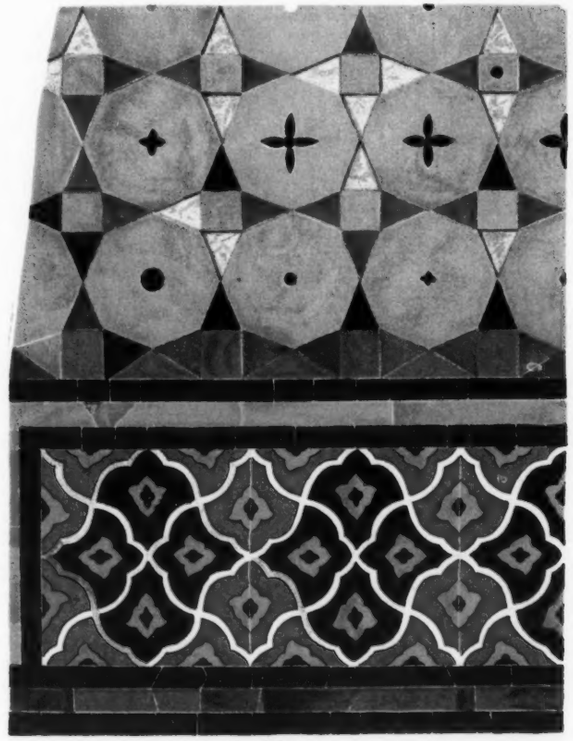


Fig. 2.

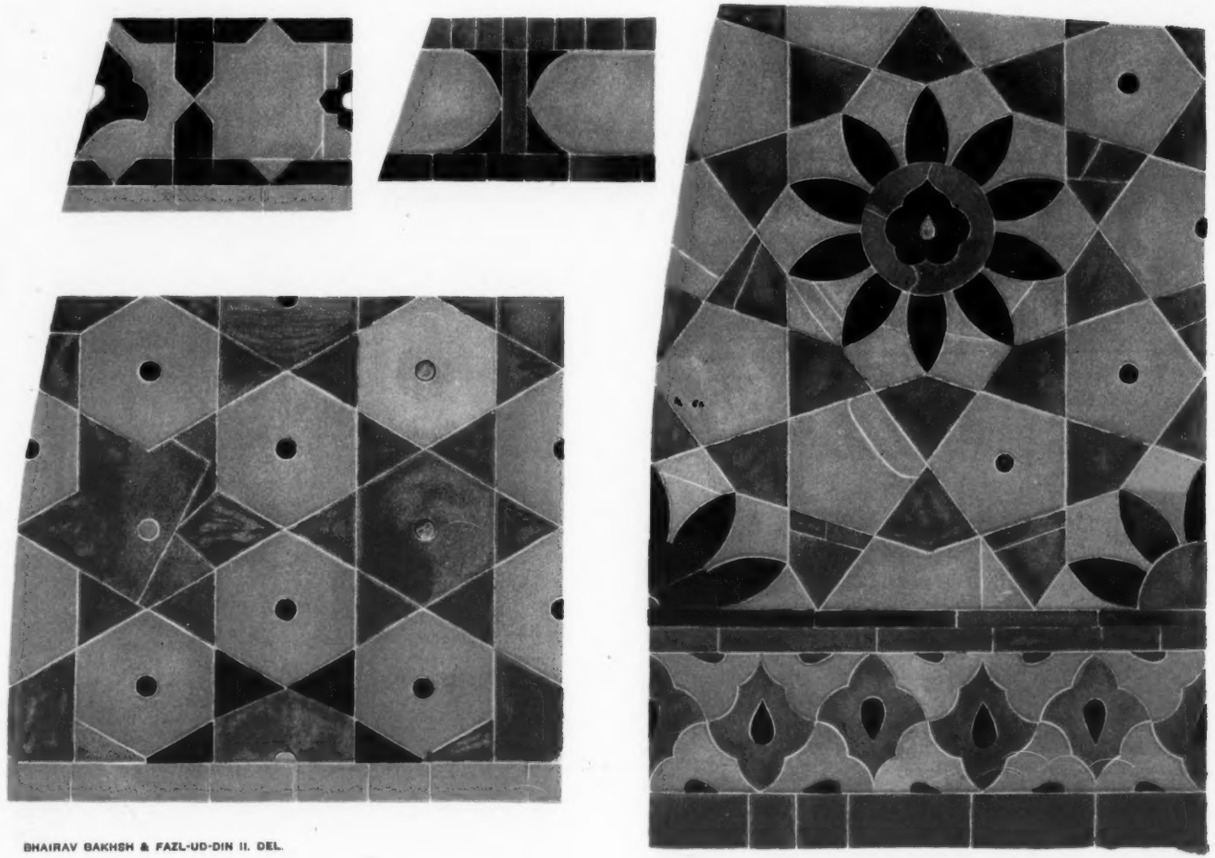
Inches 12 9 6 3 1 Foot

SCALE

BHAIRAV BAKHSH & FAZL-UD-DIN II. DEL

Archæological Surveyor N.W.P.

SIKANDRA: AKBAR'S TOMB. TILED ORNAMENTATION UPON THE KIOSQUES ROUND THE THIRD FLOOR.

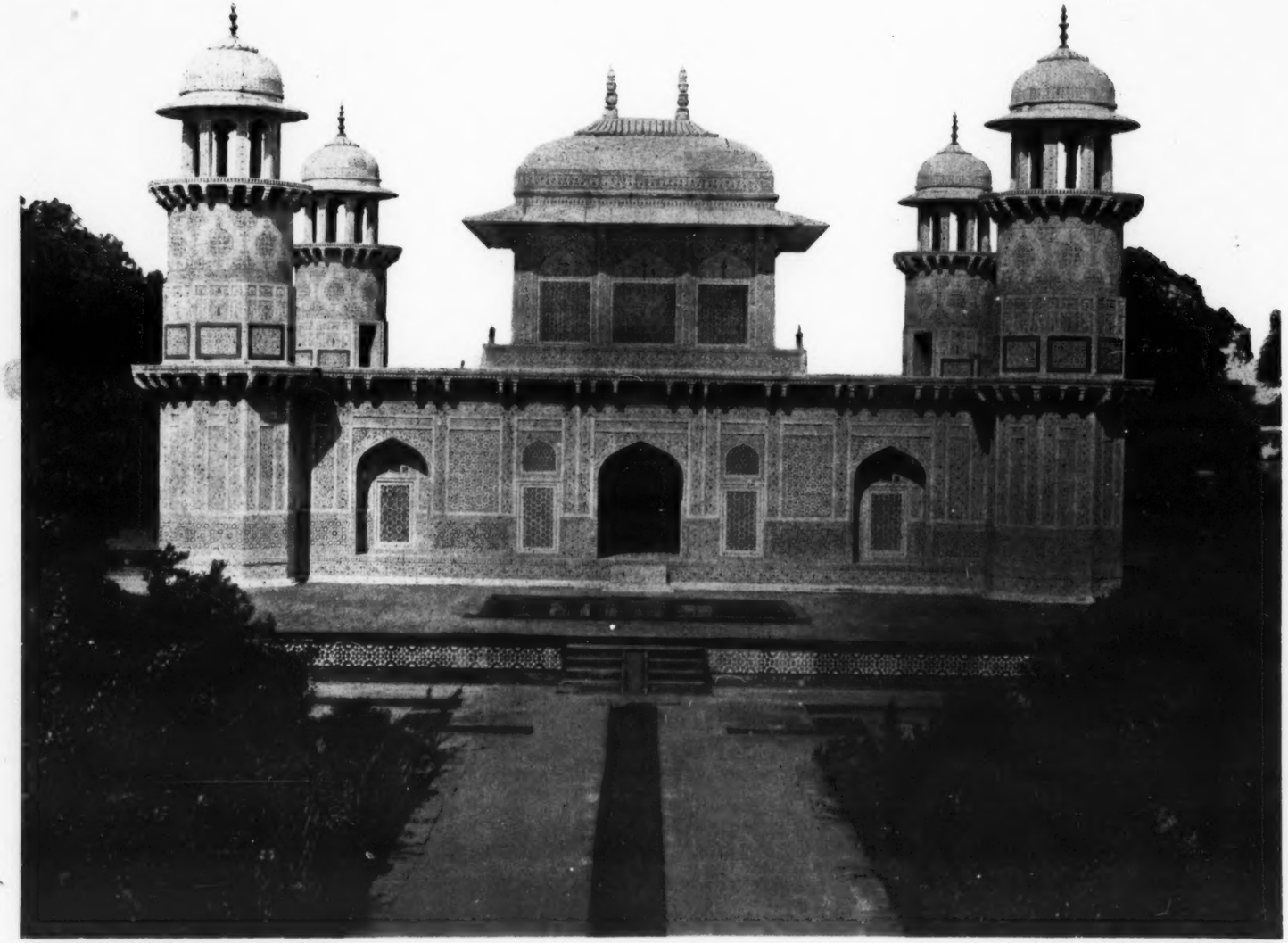


BHAIRAV BAKHSH & FAZL-UD-DIN II. DEL.

Inches 12 9 6 3 1 Foot

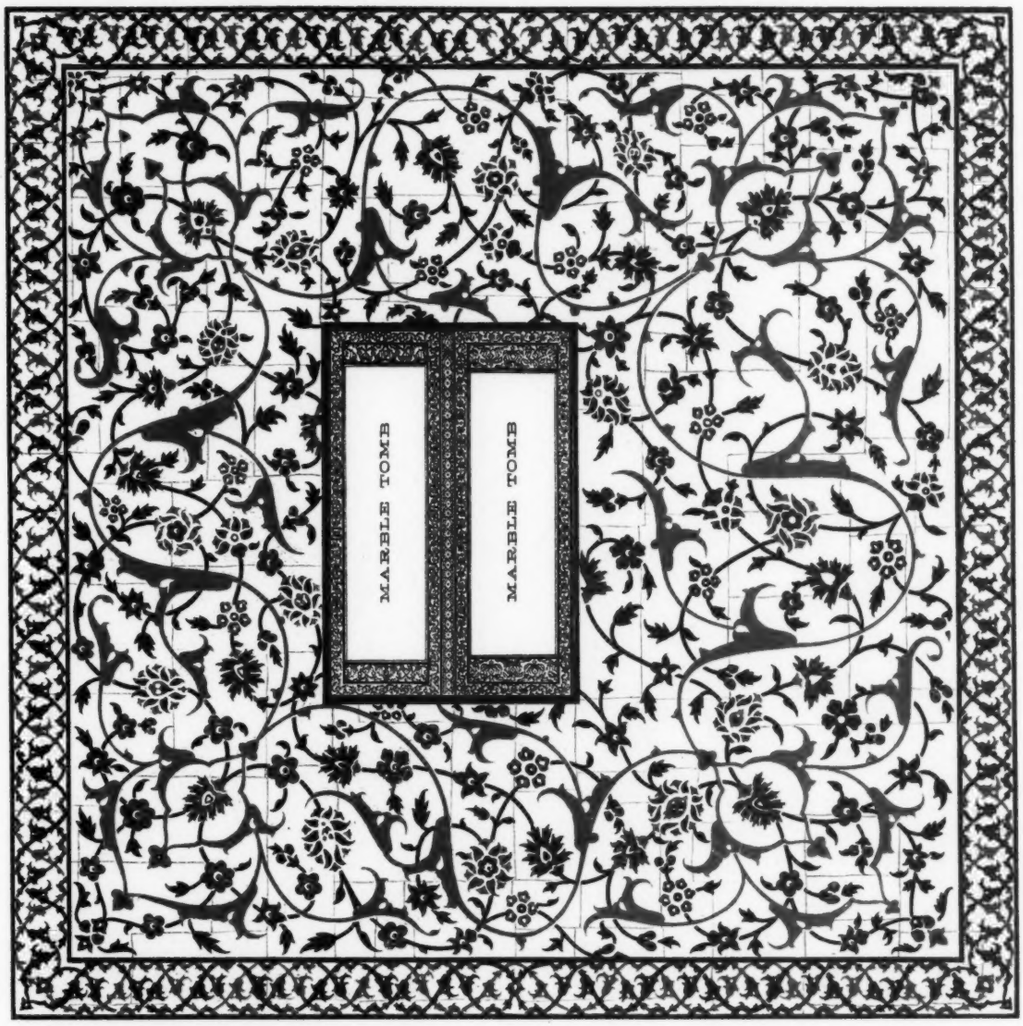
SCALE

Archæological Surveyor N.W.P.



165.—Agra: Itimâd-ud-daulah's Tomb—General View.

AGRA: ITIMAD-UD-DAULAH'S TOMB. MOSAIC PAVEMENT ON THE UPPER FLOOR.



RAM SINGH & BHAIRAV BAKHSH, DEL.

Inches 0 6 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 Feet

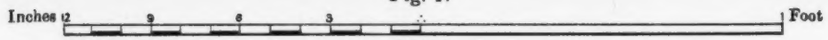
SCALE OF FEET

Edwd. R. Smith

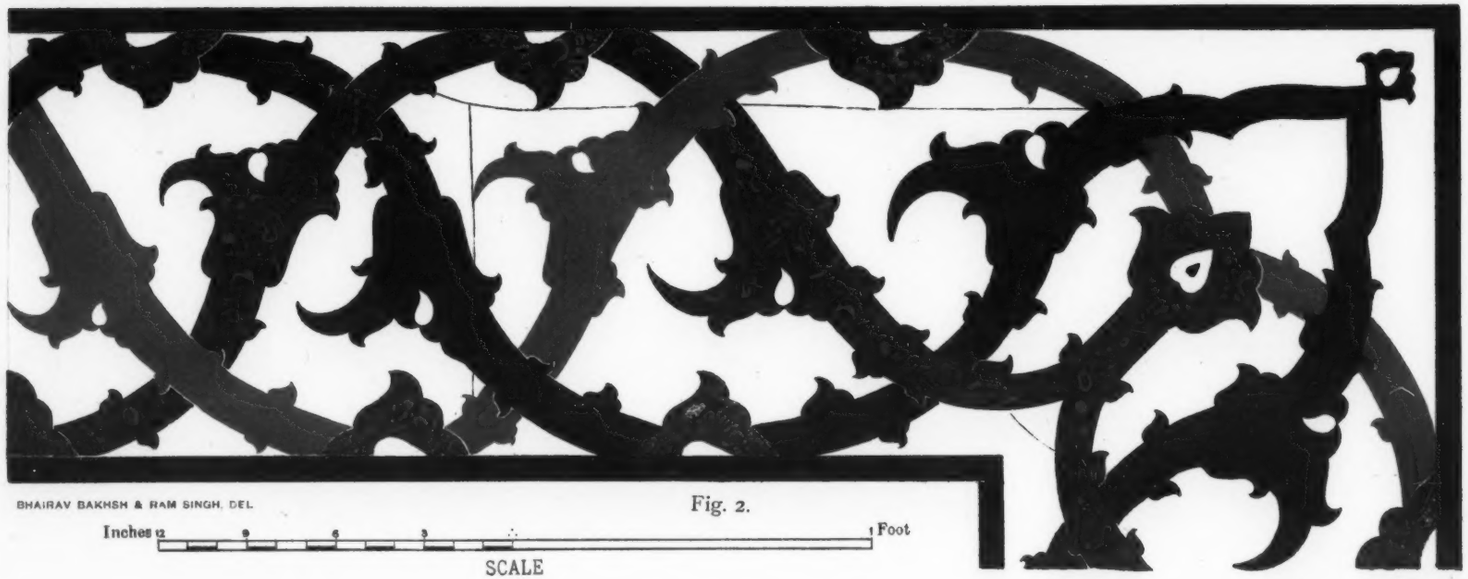
Archæological Surveyor N.W.P.

AGRA : ITIMAD-UD-DAULAH'S TOMB. DETAILS OF MOSAIC BORDERS ROUND THE CENOTAPHS AND MOSAIC PAVEMENT ON THE UPPER FLOOR.

Fig. 1.



SCALE



BHAIRAV BAKHSH & RAM SINGH, DEL.

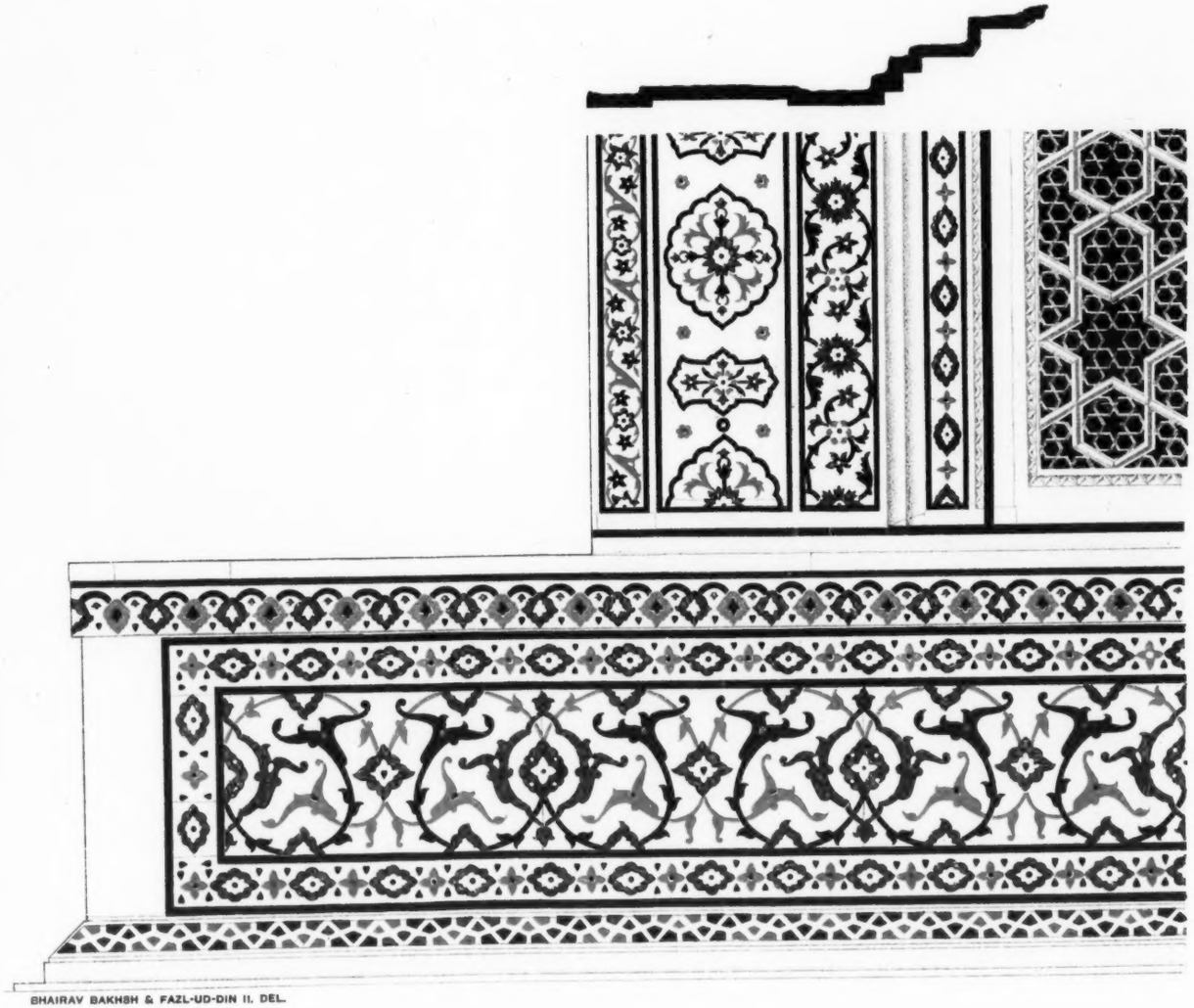
Fig. 2.

SCALE

Edward Smith

Archæological Surveyor N.W.P.

AGRA: ITIMAD-UD-DAULAH'S TOMB. INLAID ORNAMENTATION UPON THE PLINTH OF THE UPPER FLOOR.



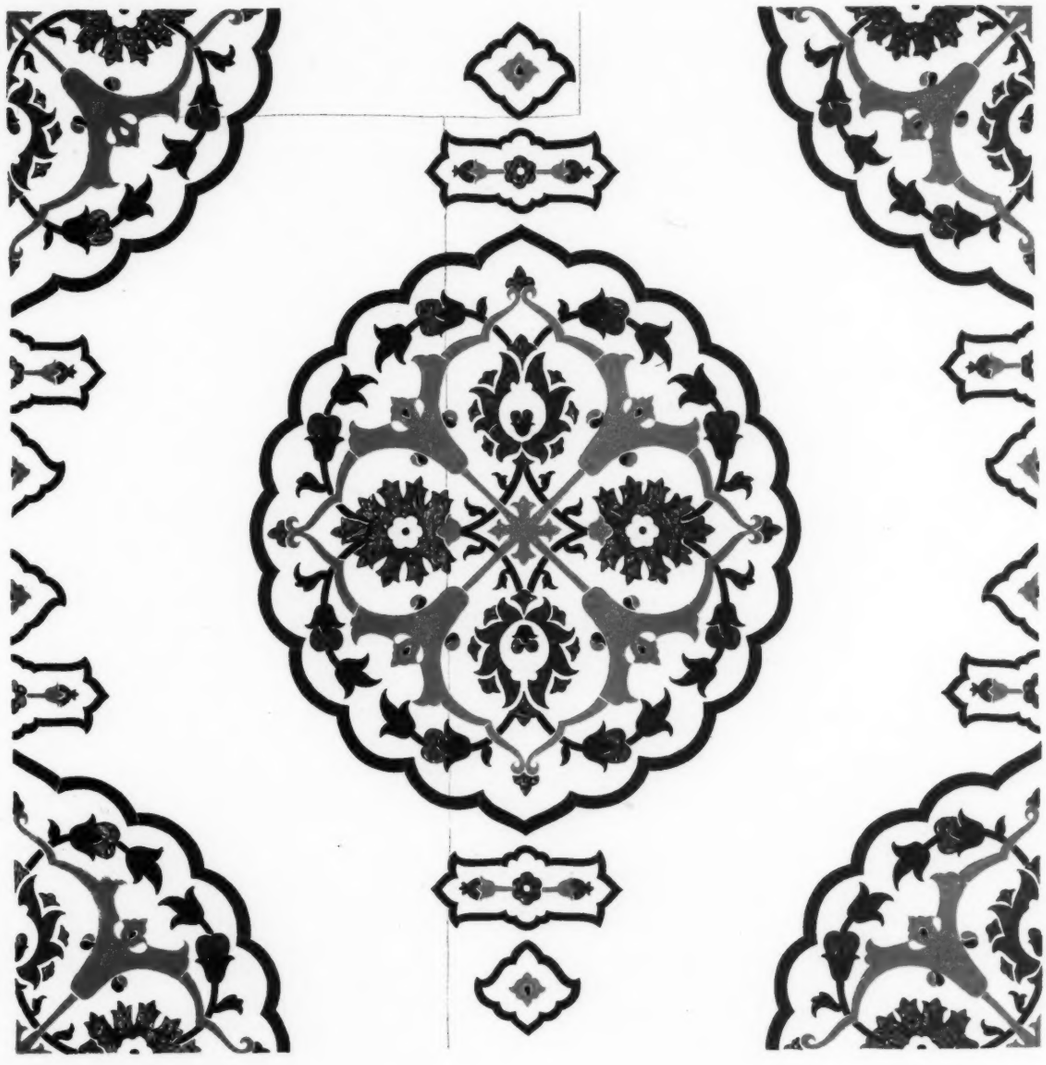
BHAIRAV BAKHSH & FAZL-UD-DIN II. DEL.

Inches 12 9 6 3 0 1 2 3 Feet

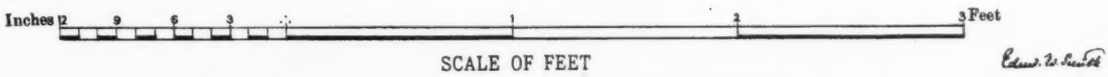
SCALE OF FEET

Archæological Surveyor N.W.P.

AGRA: ITIMAD-UD-DAULAH'S TOMB. INLAID ORNAMENTATION UPON THE UPPER PART OF THE TURRETS UPON THE ANGLES OF THE BUILDING.



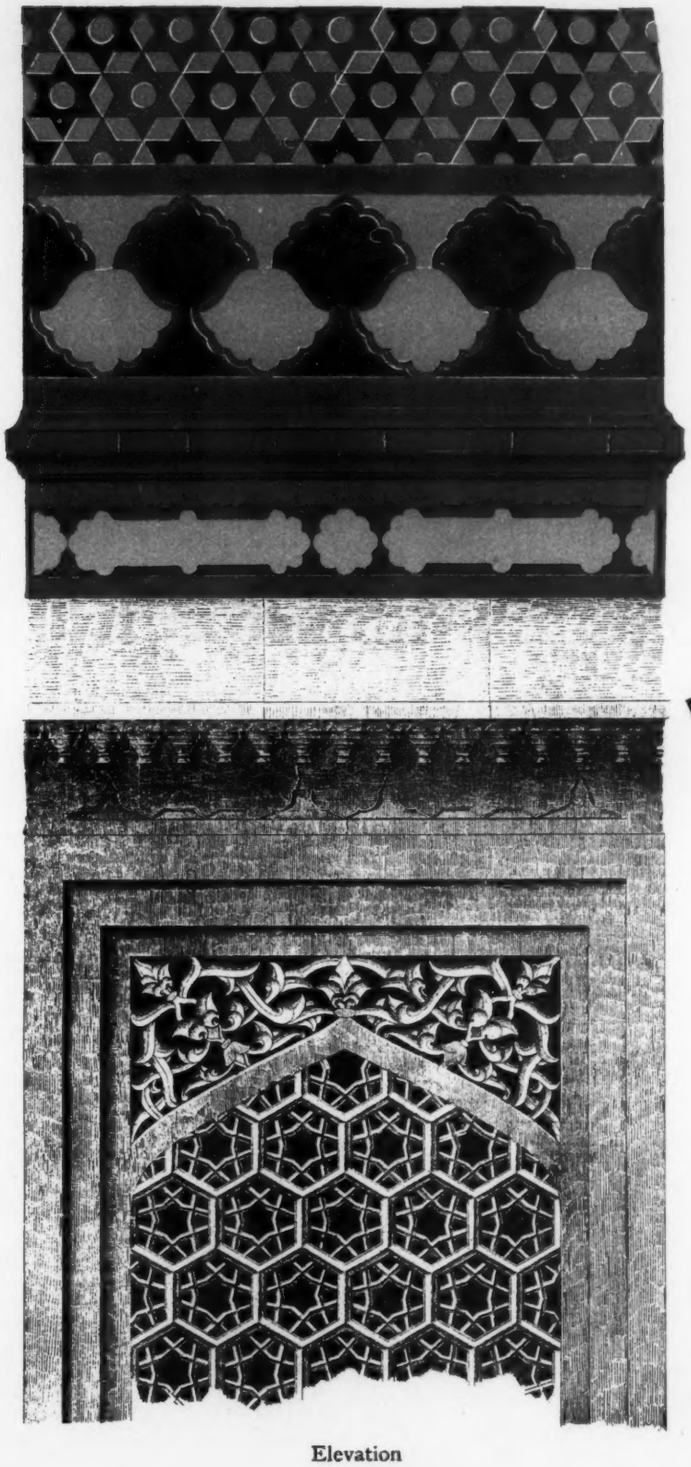
BHAIRAV BAKHSH & FAZL-UD-DIN II. DEL.



SCALE OF FEET

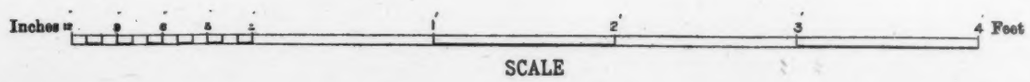
Archæological Surveyor N.W.P.

SIKANDRA: THE KÂNCH MAHAL. DETAIL OF THE UPPER PART OF THE BAY WINDOWS.



Elevation

Section



SCALE

Edmd. W Smith

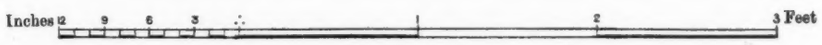
FAZL-UD-DIN I. & SOHUN LAL, DEL.

Archæological Surveyor N.W.P.

SIKANDRA: THE KÂÑCH MAHAL. DETAIL OF THE MAIN CORNICE AND PANELLING UPON THE PORCH WALLS.

Fig. 1. Detail of coloured tiles on main cornice.

Section



SCALE OF FEET

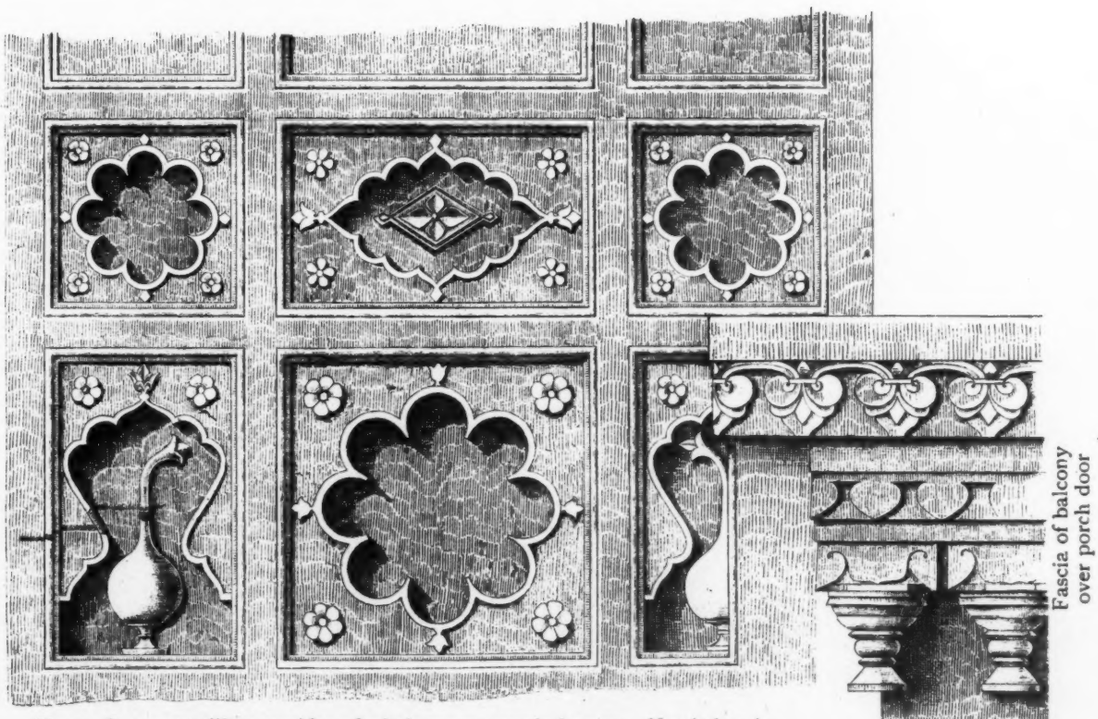
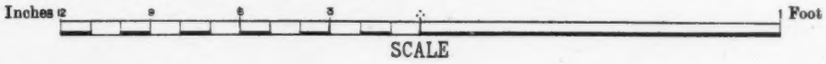


Fig. 2. Stone panelling on sides of window over porch doorway, North façade.



SCALE

RAM SINGH & BHAIRAV BAKHSH, DEL.

Archæological Surveyor N.W.P.